STIC Search Report
EIC 1700

STIC Database Tracking Number: 120559

TO: Gregg Cantelmo
Location:
Art Unit : 1745
May 6, 2004

Case Serial Number: 09/700988

From: Barba Koroma
Location: EIC 1700
REM EO4 A30
Phone: 571 272 2546

barba.koroma@uspto.gov

Search Notes

Examiner Cantelmo,
Please find attached results of the search you requested. The claims were searched in multiple databases.

For your convenience, titles of hits have been listed to help you peruse the results set quickly. This is followed by a detailed printout of records. Please let me know if you have any questions.
Thanks.

=> file caplus
FILE 'CAPLUS' ENTERED AT 10:55:33 ON 06 MAY 2004

FILE COVERS 1907 - 6 May 2004 VOL 140 ISS 19
FILE LAST UPDATED: 5 May 2004 (20040505/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> file wpix
FILE 'WPIX' ENTERED AT 10:55:36 ON 06 MAY 2004

FILE LAST UPDATED: 5 MAY 2004 <20040505/UP>
MOST RECENT DERWENT UPDATE: 200429 <200429/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE, PLEASE VISIT:
http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

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http://www.thomsonscientific.com/litalert <<<

>>> THE DISPLAY LAYOUT HAS BEEN CHANGED TO ACCOMODATE THE
NEW FORMAT GERMAN PATENT APPLICATION AND PUBLICATION
NUMBERS. SEE ALSO:
http://www.stn-international.de/archive/stnews/news0104.pdf <<<

>>> SINCE THE FILE HAD NOT BEEN UPDATED BETWEEN APRIL 12-16
THERE WAS NO WEEKLY SDI RUN <<<

=> file jicst
FILE 'JICST-EPLUS' ENTERED AT 10:55:40 ON 06 MAY 2004

FILE COVERS 1985 TO 26 APR 2004 (20040426/ED)

THE JICST-EPLUS FILE HAS BEEN RELOADED TO REFLECT THE 1999 CONTROLLED
TERM (/CT) THESAURUS RELOAD.

=> file compendex
FILE 'COMPENDEX' ENTERED AT 10:55:47 ON 06 MAY 2004

FILE LAST UPDATED: 4 MAY 2004 <20040504/UP>
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
THE BASIC INDEX >>>

=> file wpix
FILE 'WPIX' ENTERED AT 10:55:51 ON 06 MAY 2004

FILE LAST UPDATED: 5 MAY 2004 <20040505/UP>
MOST RECENT DERWENT UPDATE: 200429 <200429/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

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>>> NEW! FAST-ALERTING ACCESS TO NEWLY-PUBLISHED PATENT
DOCUMENTATION NOW AVAILABLE IN DERWENT WORLD PATENTS INDEX

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    FIRST VIEW - FILE WPIFV. FREE CONNECT HOUR UNTIL 1 MAY 2004.
    FOR FURTHER DETAILS: http://www.thomsonderwent.com/dwpifv  <<<

>>> NEW! IMPROVE YOUR LITIGATION CHECKING AND INFRINGEMENT
    MONITORING WITH LITALERT. FIRST ACCESS TO RECORDS OF IP
    LAWSUITS FILED IN THE 94 US DISTRICT COURTS SINCE 1973.
    FOR FURTHER DETAILS:
    http://www.thomsonscientific.com/litalert           <<<

>>> THE DISPLAY LAYOUT HAS BEEN CHANGED TO ACCOMODATE THE
    NEW FORMAT GERMAN PATENT APPLICATION AND PUBLICATION
    NUMBERS. SEE ALSO:
    http://www.stn-international.de/archive/stnews/news0104.pdf <<<

>>> SINCE THE FILE HAD NOT BEEN UPDATED BETWEEN APRIL 12-16
    THERE WAS NO WEEKLY SDI RUN  <<<

=> file metadex
FILE 'METADEX' ENTERED AT 10:56:01 ON 06 MAY 2004
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FILE LAST UPDATED: 6 APR 2004       <20040406/UP>
FILE COVERS 1966 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN THE
    BASIC INDEX (/BI) <<<

=> d que
L1   (      7022)SEA FILE=CAPLUS ABB=ON  PLU=ON  (NONAQUEOUS OR NON AQUEOUS OR
                 SOLID)(5A)SECONDARY(4A)BATTER?
L2   (         1)SEA FILE=REGISTRY ABB=ON  PLU=ON  LITHIUM/CN
L3   (         4)SEA FILE=REGISTRY ABB=ON  PLU=ON  "MANGANESE OXIDE"/CN
L4   (         1)SEA FILE=REGISTRY ABB=ON  PLU=ON  GRAPHITE/CN
L5   (     74164)SEA FILE=CAPLUS ABB=ON  PLU=ON  L2
L6   (     36364)SEA FILE=CAPLUS ABB=ON  PLU=ON  L3
L7   (     88606)SEA FILE=CAPLUS ABB=ON  PLU=ON  L4
L8   (       105)SEA FILE=CAPLUS ABB=ON  PLU=ON  WH(2A)L OR WATT(3A)(H OR HR OR
                 HOURS)(3A)(LITER OR LITRE)
L9   (        71)SEA FILE=CAPLUS ABB=ON  PLU=ON  L8 AND BATTER?
L10  (      1052)SEA FILE=CAPLUS ABB=ON  PLU=ON  BATTER?(5A)ELECTRODE(5A)(POROUS
                 ? OR DENS? OR PERMEAB? OR PERCOLA?)
L11  (      5680)SEA FILE=CAPLUS ABB=ON  PLU=ON  L1 AND (L5 OR LI OR LITHIUM)
L12  (      1275)SEA FILE=CAPLUS ABB=ON  PLU=ON  L1 AND (L7 OR GRAPHITE?)
L13  (      1117)SEA FILE=CAPLUS ABB=ON  PLU=ON  L1 AND (L6 OR MANGANESE OXIDE
                 OR MNO2)
L14  (      5845)SEA FILE=CAPLUS ABB=ON  PLU=ON  L11 OR L12 OR L13
L15  (      1123)SEA FILE=CAPLUS ABB=ON  PLU=ON  L9 OR L10
L16  (        74)SEA FILE=CAPLUS ABB=ON  PLU=ON  L15 AND (WATT? OR WH)
L17  (        42)SEA FILE=CAPLUS ABB=ON  PLU=ON  L16 AND (GRAPHITE? OR CARBON?
                 OR METAL? OR RESIN OR POLYMER?)
L18  (        22)SEA FILE=WPIX ABB=ON  PLU=ON  L16 AND (GRAPHITE? OR CARBON? OR
                 METAL? OR RESIN OR POLYMER?)
```

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L19 (          6)SEA FILE=METADEX ABB=ON  PLU=ON  L16 AND (GRAPHITE? OR CARBON?
                 OR METAL? OR RESIN OR POLYMER?)
L20 (         21)SEA FILE=COMPENDEX ABB=ON  PLU=ON  L16 AND (GRAPHITE? OR
                 CARBON? OR METAL? OR RESIN OR POLYMER?)
L21 (          4)SEA FILE=JICST-EPLUS ABB=ON  PLU=ON  L16 AND (GRAPHITE? OR
                 CARBON? OR METAL? OR RESIN OR POLYMER?)
L22 (        426)SEA FILE=CAPLUS ABB=ON  PLU=ON  L14 AND BATTER?(5A)CONTROL?
L23 (        326)SEA FILE=CAPLUS ABB=ON  PLU=ON  L22 AND (GRAPHITE? OR CARBON?
                 OR METAL? OR RESIN OR POLYMER?)
L24 (         97)SEA FILE=CAPLUS ABB=ON  PLU=ON  L23 AND (POLY? OR RESIN)
L25 (         74)SEA FILE=CAPLUS ABB=ON  PLU=ON  L24 AND CARBON?
L26 (         22)SEA FILE=CAPLUS ABB=ON  PLU=ON  L25 AND GRAPHITE?
L27 (         64)SEA FILE=CAPLUS ABB=ON  PLU=ON  L26 OR L17
L28 (         47)SEA FILE=CAPLUS ABB=ON  PLU=ON  L27 AND (POLY? OR RESIN OR
                 GRAPHITE? OR CARBON?)
L29 (         21)SEA FILE=WPIX ABB=ON  PLU=ON  L18 AND (POLY? OR RESIN OR
                 GRAPHITE? OR CARBON?)
L30 (         18)SEA FILE=COMPENDEX ABB=ON  PLU=ON  L20 AND (POLY? OR RESIN OR
                 GRAPHITE? OR CARBON?)
L31 (         89)DUP REM L28 L29 L19 L30 L21 (7 DUPLICATES REMOVED)
L32 (         47)SEA FILE=CAPLUS L31
L33 (         39)SEA FILE=CAPLUS L32 AND SECONDARY?
L34 (         11)SEA FILE=WPIX ABB=ON  PLU=ON  L18 AND SECONDARY?
L35 (         14)SEA FILE=COMPENDEX ABB=ON  PLU=ON  L30 AND SECONDARY?
L36           68 DUP REM L33 L34 L35 L19 L21 (6 DUPLICATES REMOVED)
```

=> d ti 1-68
YOU HAVE REQUESTED DATA FROM FILE 'METADEX, JICST-EPLUS, CAPLUS, WPIX, COMPENDEX' -
CONTINUE? (Y)/N:y

L36 ANSWER 1 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **battery**

L36 ANSWER 2 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
TI Nonaqueous **secondary batteries**

L36 ANSWER 3 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
TI Nonaqueous **secondary battery**

L36 ANSWER 4 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **battery**

L36 ANSWER 5 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **battery**

L36 ANSWER 6 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Nonaqueous** electrolyte **secondary battery**
having high charge-discharge cycle property

L36 ANSWER 7 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **battery** with improved structure for long life

L36 ANSWER 8 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Slurry for forming **secondary nonaqueous** **battery** anode coating film and its adjustment

L36 ANSWER 9 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer** electrolyte, and **secondary nonaqueous** electrolyte **battery**

L36 ANSWER 10 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **battery**

L36 ANSWER 11 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Non-aqueous **secondary battery** contains anode active material containing lithium-nickel group and lithium-manganese group complex oxides and cathode active material containing mixture of double-layered **graphite** particles.

L36 ANSWER 12 OF 68 JICST-EPlus COPYRIGHT 2004 JST on STN
TI Laminated Thin Li-Ion **Batteries** Using LiNi0.8-yCo0.2AlyO2 Cathode Materials

L36 ANSWER 13 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Nonaqueous **secondary** electric **battery**

L36 ANSWER 14 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Flat **secondary** nonaqueous-electrolyte **battery** with long cycle life and high safety

L36 ANSWER 15 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary** lithium **battery**

L36 ANSWER 16 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous**-electrolyte **battery** with active mass layer having **controlled** porosity

L36 ANSWER 17 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Anode and **secondary nonaqueous** electrolyte **battery**

L36 ANSWER 18 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Non-aqueous **secondary battery** for electric vehicle sets lamination thickness of **metal** plate with **resin** layers to prescribed value.

L36 ANSWER 19 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Non-aqueous electrolyte **secondary battery** for electronic devices has preset ratio of thickness of anode to separator, ratio of thickness of cathode to separator, and ratio of thickness of

battery to electrode group.

L36 ANSWER 20 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer battery** R & D in the US

L36 ANSWER 21 OF 68 JICST-EPlus COPYRIGHT 2004 JST on STN
TI Development of High-performance Lithium-ion **Polymer Battery.**

L36 ANSWER 22 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 3
TI Heat-resistant nonaqueous electrolyte **secondary batteries** for power storage

L36 ANSWER 23 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI All-solid-state electrochemical device and method of manufacturing

L36 ANSWER 24 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer** electrolytes

L36 ANSWER 25 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Method for initial charging **secondary nonaqueous** electrolyte **battery**

L36 ANSWER 26 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **batteries** and their manufacture

L36 ANSWER 27 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Non-aqueous **secondary battery** for storage systems, is flat and contains electrolyte containing ethylene **carbonate** and ethylmethyl **carbonate** as non-aqueous solvent.

L36 ANSWER 28 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Non-aqueous **secondary battery** has positive electrode, negative plate of **graphite** active material of specific surface area, and lithium salt containing non-aqueous electrolyte, and has preset volume energy density.

L36 ANSWER 29 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
TI Lithium-ion **batteries** for mobile IT terminals

L36 ANSWER 30 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI 18650 size lithium-ion rechargeable **battery** with advanced performance

L36 ANSWER 31 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **batteries** using improved anodes

L36 ANSWER 32 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary batteries** with **polymer solid** electrolyte films

L36 ANSWER 33 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Organic electrolyte **battery** for electric power storage system, has lithium salt dissolved in non-aqueous solvent containing ethylene **carbonate**, dimethyl **carbonate** as electrolyte and has specific properties.

L36 ANSWER 34 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Alkali **secondary battery** for cordless device has hydrogen absorbing alloy content cathode which is immersed in aqueous potassium hydroxide during magnetization at specific conditions.

L36 ANSWER 35 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI SAFT lithium-ion **polymer battery** technology

L36 ANSWER 36 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **batteries** and **battery control** method

L36 ANSWER 37 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary** lithium **battery** with good cycling performance

L36 ANSWER 38 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Cathode structure of lithium ion **secondary battery** for portable apparatus - has cathode mixture layer of predefined density.

L36 ANSWER 39 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Electrode materials for **secondary nonaqueous** electrolyte **batteries** and manufacture of the electrodes

L36 ANSWER 40 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Manufacture of **secondary nonaqueous** electrolyte **batteries**

L36 ANSWER 41 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Technical development of **polyacene** (PAS) **batteries.** Safety and creditability

L36 ANSWER 42 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **batteries** with **carbonaceous** anodes

L36 ANSWER 43 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Manufacture of **secondary nonaqueous** electrolyte **batteries**

L36 ANSWER 44 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous** electrolyte **batteries**

L36 ANSWER 45 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5
TI High performance S-type cathode

L36 ANSWER 46 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI High performance nickel-**metal** hydride and lithium-ion **batteries**

L36 ANSWER 47 OF 68 METADEX COPYRIGHT 2004 CSA on STN
TI Nickel-**metal** hydride **batteries** and **metallic** materials.

L36 ANSWER 48 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Design and performance of 10 **Wh** rechargeable lithium **batteries.**

L36 ANSWER 49 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI Performance of 10 **Wh** rechargeable lithium **batteries** using new **metal-carbon** composite anodes (Ag-deposited **graphite**)

L36 ANSWER 50 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Lithiated manganese oxide cathodes for rechargeable lithium **batteries.**

L36 ANSWER 51 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI High specific power lithium **polymer** rechargeable **battery** .

L36 ANSWER 52 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Characteristics of deeply Li-doped **polyacenic** semiconductor material and fabrication of a Li **secondary battery.**

L36 ANSWER 53 OF 68 METADEX COPYRIGHT 2004 CSA on STN
TI Performances and safety behaviour of rechargeable AA-size Li/LixMnO2 cell.

L36 ANSWER 54 OF 68 JICST-EPlus COPYRIGHT 2004 JST on STN
TI Lithium Secondary **Batteries.**

L36 ANSWER 55 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Development of coin-type lithium-ion rechargeable **batteries.**

L36 ANSWER 56 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI LixNiO2, a promising cathode for rechargeable lithium **batteries.**

L36 ANSWER 57 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Performances and safety behaviour of rechargeable AA-size Li/LixMnO2 cell.

L36 ANSWER 58 OF 68 METADEX COPYRIGHT 2004 CSA on STN
TI Disordered materials in consumer and electric-vehicle nickel-hydride **batteries.**

L36 ANSWER 59 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Lithium-ion rechargeable **batteries** with LiCoO2 and **carbon** electrodes: The LiCoO2/C system.

L36 ANSWER 60 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Directions in **secondary** lithium **battery** research and development.

L36 ANSWER 61 OF 68 METADEX COPYRIGHT 2004 CSA on STN
TI Nickel/**Metal** Hydride **Batteries** Using Microencapsulated Hydrogen Storage Alloy.

L36 ANSWER 62 OF 68 METADEX COPYRIGHT 2004 CSA on STN
TI Ovonic nickel **metal** hydride **batteries** for space applications.

L36 ANSWER 63 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Preparation of **polypyrrole** and **polythiophene** in the presence of ferrocene derivatives.

L36 ANSWER 64 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Novel solid redox **polymerization** electrodes.All-solid-state, thin-film, rechargeable lithium **batteries.**

L36 ANSWER 65 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous batteries**

L36 ANSWER 66 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
TI FEASIBILITY STUDY OF A NEW ZINC-AIR BATTERY CONCEPT USING FLOWING ALKALINE ELECTROLYTE.

L36 ANSWER 67 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Secondary nonaqueous batteries**

L36 ANSWER 68 OF 68 METADEX COPYRIGHT 2004 CSA on STN
TI Technico-Economic Assessment of **Batteries** for Electric Road Vehicles.

```
=> d all 1-68 l36
YOU HAVE REQUESTED DATA FROM FILE 'METADEX, JICST-EPLUS, CAPLUS, WPIX, COMPENDEX' -
CONTINUE? (Y)/N:y
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L36 ANSWER 1 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:139821 CAPLUS
DN 140:202393
ED Entered STN: 20 Feb 2004
TI **Secondary nonaqueous** electrolyte **battery**
IN Sasaki, Takeshi
PA Japan Storage Battery Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent

LA   Japanese
IC   ICM H01M010-40
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004055230	A2	20040219	JP 2002-208587	20020717
PRAI	JP 2002-208587		20020717		

AB   The battery has a cathode comprising a **Li** containing composite oxide active mass, an anode containing an anode active mass, and a nonaq. electrolyte solution containing vinylene **carbonate**; where the electrolyte solution contains ≤100 ppm **polymethylol** having a repeating unit -[CH(OH)CH(OH)]-.
ST   **secondary** battery electrolyte vinylene **carbonate** **polymethylol**
IT   Battery electrolytes
  Secondary batteries
   (electrolyte solns. containing **polymethylol** with **controlled** concentration for **secondary batteries**)
IT   **7782-42-5, Graphite**, uses
  RL: DEV (Device component use); USES (Uses)
   (anode active mass; electrolyte solns. containing **polymethylol** with **controlled** concentration for **secondary batteries**)
IT   12190-79-3, Cobalt **lithium** oxide (CoLiO2)
  RL: DEV (Device component use); USES (Uses)
   (cathode active mass; electrolyte solns. containing **polymethylol** with **controlled** concentration for **secondary batteries**)
IT   96-49-1, Ethylene **carbonate**   623-53-0, Ethyl methyl **carbonate**   872-36-6, Vinylene **carbonate**   21324-40-3, **Lithium** hexafluorophosphate   25323-67-5
  RL: DEV (Device component use); USES (Uses)
   (electrolyte solns. containing **polymethylol** with **controlled** concentration for **secondary batteries**)

L36 ANSWER 2 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
AN   2003:773815 CAPLUS
DN   139:294629
ED   Entered STN: 03 Oct 2003
TI   Nonaqueous **secondary batteries**
IN   Kuriyama, Kazuya; Kato, Shiro; Okano, Yukiko; Yokouchi, Kae; Yada, Shizukuni; Tajiri, Hiroyuki
PA   Osaka Gas Co., Ltd., Japan
SO   Jpn. Kokai Tokkyo Koho, 12 pp.
  CODEN: JKXXAF
DT   Patent
LA   Japanese
IC   ICM H01M010-40
  ICS H01M002-02; H01M004-02; H01M004-58
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
  Section cross-reference(s): 57

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003282140	A2	20031003	JP 2002-86531	20020326
PRAI	JP 2002-86531		20020326		

AB The title flat **batteries** have (1) an energy capacity ≥30 **Wh**, (2) volume energy d. ≥180 **Wh/l**, (3) an anode activation mixture containing LixMn2-yMAyO4+z (MA = Mg, Al, Cr, Fe, Co, Ni) and LiaNibMBcO2 (MB = Co, Al, Mn), (4) a cathode activation mixture of amorphous **carbon**-coated **graphite** particles and of graphitized mesocarbon microbeads wherein the double-layer mixture absorbing Li at 200-255 mAh/g-activation-material in full charging condition, and (5) nonaq. electrolyte in a solvent mixture containing ethylene **carbonate** (EC), Et Me **carbonate** (EMC), and di-Et **carbonate** (DEC) wherein EMC-DEC volume is 50-90 volume% of the total solvent and DEC volume is 10-40 volume% of the total solvent. The arrangement of the composition gives the **batteries** increased capacity, increased cycle lifetime, and improved low-temperature characteristics.

ST lithium manganese oxide anode activation nonaq **secondary battery**; nickel lithium oxide anode activation nonaq **secondary battery**

IT Anodes
Cathodes
(nonaq. **secondary batteries**)

IT Electrolytes
(nonaq.; nonaq. **secondary batteries**)

IT Electric activation (dopants)
(of anode and cathode, materials for; nonaq. **secondary batteries**)

IT 216588-85-1, Cobalt lithium nickel oxide (Co0.18LiNi0.82O2) 362666-83-9, Aluminum lithium manganese oxide (Al0.1Li1.1Mn1.8O4)
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(anode activation material; nonaq. **secondary batteries**)

IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 623-53-0, Methyl ethyl **carbonate**
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(electrolyte mixture; nonaq. **secondary batteries**)

IT 7782-42-5, **Graphite**, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(particles, coated with amorphous **carbon**; nonaq. **secondary batteries**)

L36 ANSWER 3 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
AN 2003:773748 CAPLUS
DN 139:294545
ED Entered STN: 03 Oct 2003
TI Nonaqueous **secondary battery**
IN Kato, Shiro; Yokouchi, Kae; Yada, Shizukuni; Tajiri, Hiroyuki
PA Osaka Gas Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003282057	A2	20031003	JP 2002-86112	20020326
PRAI	JP 2002-86112		20020326		

AB The title **battery** has a flat shape with a thickness of ≤12 mm, energy capacity ≥30 **Wh**, and volume energy d. ≥180 **Wh/L.** The **battery** consists of pos. electrods, neg. electrodes, separators, and nonaq. electrolyte containing Li salt in a **battery** container. Li composite is used as pos. electrode active material. The neg. electrode active material is made of dual structured **graphite** particles with the surface covered by amorphous C layer or a its mix. with graphitized mesocarbon microbeads. The **graphite** particles have a face spacing of ≥0.34 nm measured by x ray wide angle refraction method on (002) plane. The electrolyte solution consists of ethylene **carbonate** and ethylmethyl **carbonate**, or a mix. of ethylene **carbonate** with ethylmethyl **carbonate** and di-Et **carbonate.**

ST nonaq **secondary battery** electrode active material

Priority Doc

IT Microspheres
(meso C; nonaq. **secondary battery** using pos. and neg. electrode active material)
IT Electrodes
(nonaq. **secondary battery** using pos. and neg. electrode active material)
IT **Carbon** black, uses
RL: DEV (Device component use); USES (Uses)
(nonaq. **secondary battery** using pos. and neg. electrode active material)
IT **Secondary batteries**
(nonaq.; nonaq. **secondary battery** using pos. and neg. electrode active material)
IT 7440-44-0, **Carbon**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(amorphous; nonaq. **secondary battery** using pos. and neg. electrode active material)
IT 7782-42-5, **Graphite**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(dual structured particles; nonaq. **secondary battery** using pos. and neg. electrode active material)
IT 116-14-3, Tetrafluoroethylene, uses 9003-07-0, **Polypropylene**
113066-89-0, Cobalt Lithium nickel oxide Co0.2LiNi0.8O2
RL: DEV (Device component use); USES (Uses)
(nonaq. **secondary battery** using pos. and neg.

electrode active material)
IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl
carbonate 623-53-0, Ethylmethyl **carbonate**
12057-17-9, Lithium manganese oxide $LiMn_2O_4$
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. **secondary battery** using pos. and neg.
electrode active material)

L36 ANSWER 4 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:634136 CAPLUS
DN 139:152391
ED Entered STN: 15 Aug 2003
TI **Secondary nonaqueous** electrolyte **battery**
IN Ito, Hidetoshi; Naruse, Yoshiaki; Yamamoto, Takeru
PA Sony Corporation, Japan
SO PCT Int. Appl., 21 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M010-40; H01M004-62
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003067688	A1	20030814	WO 2003-JP808	20030128
	W: CN, KR, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR				
	JP 2003229179	A2	20030815	JP 2002-27201	20020204
PRAI	JP 2002-27201	A	20020204		

AB The battery has a rolled electrode group containing a separator between an anode, a cathode, and a **polymer** electrolyte in a battery case; where the anode contains a **metal** fluoride MFn (M = Cu, Ni, Ag, Ti, Sn, and/or Cr; n = integer) before initial charging, and the amount of fluoride satisfies m = 0.0036-0.36 Q/nF [Q = initial charge capacity (mAh); F = Faraday constant (C/mol)].
ST **secondary battery** anode additive **metal**
fluoride content **control**
IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(electrolyte; electrode binder; anodes containing **metal** fluorides
with **controlled** amount for **secondary lithium**
batteries)
IT 7789-19-7, Copper fluoride (CuF_2)
RL: MOA (Modifier or additive use); USES (Uses)
(anode additive; anodes containing **metal** fluorides with
controlled amount for **secondary lithium**
batteries)
IT 96-49-1, Ethylene **carbonate** 108-32-7, Propylene
carbonate 616-38-6, Dimethyl **carbonate** 21324-40-3,
Lithium hexafluorophosphate

```
     RL: DEV (Device component use); USES (Uses)
        (anodes containing metal fluorides with controlled amount
        for secondary lithium batteries)
IT   12190-79-3, Cobalt lithium oxide (CoLiO2)
     RL: DEV (Device component use); USES (Uses)
        (cathode; anodes containing metal fluorides with
        controlled amount for secondary lithium
        batteries)
IT   24937-79-9, PVDF
     RL: DEV (Device component use); USES (Uses)
        (electrolyte; electrode binder; anodes containing metal fluorides
        with controlled amount for secondary lithium
        batteries)
IT   7782-42-5, Graphite, uses
     RL: DEV (Device component use); USES (Uses)
        (synthetic; anode; anodes containing metal fluorides with
        controlled amount for secondary lithium
        batteries)
RE.CNT  4     THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Nec Corp; JP 2002141058 A 2002 CAPLUS
(2) Sanyo Electric Co Ltd; JP 08-321326 A 1996 CAPLUS
(3) Sanyo Electric Co Ltd; JP 200168154 A 2001
(4) Yuasa Corp; JP 11-45740 A 1999 CAPLUS

L36  ANSWER 5 OF 68  CAPLUS  COPYRIGHT 2004 ACS on STN
AN   2003:532919  CAPLUS
DN   139:103755
ED   Entered STN:  11 Jul 2003
TI   Secondary nonaqueous electrolyte battery
IN   Sano, Hideki; Sugafuji, Masaya; Yamamoto, Norihiro; Kitagawa, Masaki;
     Kato, Kiyomi; Matsuno, Hiroshi; Nunome, Jun; Kawatate, Yutaka
PA   Matsushita Electric Industrial Co., Ltd., Japan
SO   PCT Int. Appl., 40 pp.
     CODEN: PIXXD2
DT   Patent
LA   Japanese
IC   ICM  H01M002-16
     ICS  H01M010-40
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
PI   WO 2003056644      A1   20030710      WO 2002-JP5818   20020611
         W:  CN, KR, US
         RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,
             PT, SE, TR
     JP 2003197172      A2   20030711      JP 2001-393417   20011226
PRAI JP 2001-393417     A    20011226
AB   The battery has an electrode group, containing a separator between an anode
     and a cathode, and a nonaq. electrolyte in a battery case; where the
     separator is made of a polyolefin resin and has
```

≥1 layer comprising a **polypropylene resin** which
contains. an antioxidant agent having m.p. ≥60°, and the
polypropylene resin layer is connected to the cathode.
ST **secondary** battery separator **polyolefin**
polypropylene resin antioxidant agent
IT **Secondary** batteries
(**lithium**; **polyolefin** separators containing antioxidant
agents with **controlled** m.p. for **secondary**
lithium batteries)
IT **Secondary** battery separators
(**polyolefin** separators containing antioxidant agents with
controlled m.p. for **secondary lithium**
batteries)
IT 119-47-1, 2,2'-Methylene bis(4-methyl-6-t-butylphenol) 36443-68-2
68407-88-5 95895-56-0 107603-06-5
RL: DEV (Device component use); USES (Uses)
(antioxidant agent; **polyolefin** separators containing antioxidant
agents with **controlled** m.p. for **secondary**
lithium batteries)
IT 12190-79-3, Cobalt **lithium** oxide ($CoLiO_2$)
RL: DEV (Device component use); USES (Uses)
(cathode; **polyolefin** separators containing antioxidant agents
with **controlled** m.p. for **secondary lithium**
batteries)
IT 96-49-1, Ethylene **carbonate** 623-53-0, Ethyl methyl
carbonate
RL: DEV (Device component use); USES (Uses)
(electrolyte; **polyolefin** separators containing antioxidant agents
with **controlled** m.p. for **secondary lithium**
batteries)
IT 616-38-6, Dimethyl **carbonate** 872-36-6, Vinylene
carbonate
RL: MOA (Modifier or additive use); USES (Uses)
(electrolyte; **polyolefin** separators containing antioxidant agents
with **controlled** m.p. for **secondary lithium**
batteries)
IT 9002-88-4, **Polyethylene** 9003-07-0, **Polypropylene**
80693-00-1D, cyclic 90498-90-1
RL: DEV (Device component use); USES (Uses)
(**polyolefin** separators containing antioxidant agents with
controlled m.p. for **secondary lithium**
batteries)
IT **7782-42-5**, **Graphite**, uses
RL: DEV (Device component use); USES (Uses)
(synthetic; anode; **polyolefin** separators containing antioxidant
agents with **controlled** m.p. for **secondary**
lithium batteries)
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Asahi Kasei Corp; JP 2002105235 A 2002 CAPLUS
(2) Mitsubishi Chemical Corp; JP 2000251943 A 2000 CAPLUS
(3) Mitsubishi Chemical Corp; JP 200030685 A 2000

(4) Nitto Denko Corp; JP 04-181651 A 1992 CAPLUS
(5) Nitto Denko Corp; JP 200048794 A 2000
(6) Sumitomo Chemical Co Ltd; EP 1168469 A2 2002 CAPLUS
(7) Sumitomo Chemical Co Ltd; US 20020034689 A1 2002
(8) Sumitomo Chemical Co Ltd; JP 200269221 A 2002
(9) Sumitomo Chemical Co Ltd; CA 2350379 A1 2002
(10) Ube Industries Ltd; JP 07-307146 A 1995 CAPLUS
(11) Ube Industries Ltd; CA 2149284 A 1995 CAPLUS
(12) Ube Industries Ltd; US 5691047 A 1995 CAPLUS
(13) Ube Industries Ltd; EP 682376 A1 1995 CAPLUS
(14) Ube Industries Ltd; JP 2000204174 A 2000 CAPLUS

L36 ANSWER 6 OF 68 CAPLUS
AN 2003:910332 CAPLUS
DN 139:397960
ED Entered STN: 21 Nov 2003
TI **Nonaqueous** electrolyte **secondary battery** having high charge-discharge cycle property
IN Tanizaki, Hiroaki; Komaru, Atsuo
PA Sony Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M004-38; H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003331826	A2	20031121	JP 2002-133085	20020508
	US 2004029012	A1	20040212	US 2003-430778	20030506
	CN 1457110	A	20031119	CN 2003-136061	20030508
PRAI	JP 2002-133085	A	20020508		

AB The **nonaq.** electrolyte **secondary battery** has cathode having a cathode active mass layer containing a **Li** doping/dedoping cathode active material, anode having an anode active mass layer containing a 1st active material from **Li**-doping/dedoping **metal**, alloy or compound, which can form a compound with **Li**, and a 2nd active material from **Li**-doping/dedoping C material, and an electrolyte containing electrolytic salts, wherein the anode active material contains ≥ 10 weight% of the 1st active material and the packing ratio $y/((ax + bz)/(a+b))$ of the anode active mass layer is 0.5-0.8 (a=weight of the 1st active material; b= weight of the 2nd active material; z=true sp. gr. of the 2nd active material; y=d. of the anode active mass layer). Degradation of the anode by expansion and contraction of the anode active material is prevented by controlling the packing ratio to improve the charge-discharge cycle property.
ST **nonaq** electrolyte **secondary battery** anode active material
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)

(binder; **nonaq.** electrolyte **secondary**
battery with anode active material of **controlled**
packing ratio for high charge-discharge cycle property)

IT **Battery** anodes
Secondary batteries
(**nonaq.** electrolyte **secondary battery**
with anode active material of **controlled** packing ratio for
high charge-discharge cycle property)

IT 7440-44-0, **Carbon**, uses **7782-42-5**, **Graphite**,
uses 51636-79-4 259750-80-6
RL: TEM (Technical or engineered material use); USES (Uses)
(anode active material; **nonaq.** electrolyte **secondary**
battery with anode active material of **controlled**
packing ratio for high charge-discharge cycle property)

IT 24937-79-9, **Polyvinylidene** fluoride
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; **nonaq.** electrolyte **secondary**
battery with anode active material of **controlled**
packing ratio for high charge-discharge cycle property)

IT 12190-79-3, **Lithium** cobalt oxide ($LiCoO_2$)
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode; **nonaq.** electrolyte **secondary**
battery with anode active material of **controlled**
packing ratio for high charge-discharge cycle property)

L36 ANSWER 7 OF 68 CAPLUS
AN 2003:834341 CAPLUS
DN 139:310099
ED Entered STN: 24 Oct 2003
TI **Secondary nonaqueous** electrolyte **battery**
with improved structure for long life
IN Wada, Hiroshi
PA Japan Storage Battery Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M002-16; H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	---------------	----	--------	---------------	--------
PI	JP 2003303625	A2	20031024	JP 2002-105712	20020408
PRAI	JP 2002-105712		20020408		

AB The battery has a **Li**- or **Li** alloy-containing anode, a **Li** mixed oxide-containing cathode, a separator between the electrodes, and a nonaq. electrolytic solution and satisfies b/a = 0.1-0.5 (a = total thickness of cathode active mass layer and anode active mass layer; b = separator thickness) and separator gas permeability 300-700 s/100 cc. The controlled thickness relation and permeability keeps an appropriate amount of the electrolytic solution between the electrodes to prolong the service

life.
ST **lithium** battery separator gas permeability; electrode active mass thickness **lithium** battery
IT **Secondary battery** separators
(**Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT **Polyolefin** fibers
RL: DEV (Device component use); USES (Uses)
(ethylene, fabrics, nonwoven, separator; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT **Carbon** fibers, uses
RL: DEV (Device component use); USES (Uses)
(**graphite**, anode active mass; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT **Secondary batteries**
(**lithium**; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT **Lithium** alloy, base
RL: DEV (Device component use); USES (Uses)
(anode containing; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT **7782-42-5**, **Graphite**, uses
RL: DEV (Device component use); USES (Uses)
(anode active mass; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT **7439-93-2**, **Lithium**, uses
RL: DEV (Device component use); USES (Uses)
(anode containing; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT 362666-83-9, Aluminum **lithium manganese oxide** ($Al_{0.1}Li_{1.1}Mn_{1.8}O_4$)
RL: DEV (Device component use); USES (Uses)
(cathode active mass; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)
IT 9002-88-4, **Polyethylene**
RL: DEV (Device component use); USES (Uses)
(microporous film, fiber, nonwoven fabric, separator; **Li battery** with **controlled** separator/active mass thickness relation and separator permeability for long life)

L36 ANSWER 8 OF 68 CAPLUS
AN 2003:586640 CAPLUS
DN 139:119946
ED Entered STN: 31 Jul 2003

TI Slurry for forming **secondary nonaqueous battery** anode coating film and its adjustment
IN Ozeki, Katsutomo; Osaki, Yoshie
PA Hitachi Funmatsu Yakin Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M004-58; H01M004-62
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003217573	A2	20030731	JP 2002-12353	20020122
PRAI	JP 2002-12353		20020122		

AB The slurry contains a solid component, comprising a **carbonaceous** active mass and a binder, and water as medium; where the viscosity characteristic of the slurry has the following relationship: $\gamma = 10\kappa + \tau n$ [γ = shear rate (s-1); τ = shear stress (Pa); κ = -1.0 .apprx. -9.0; n = 1.1-4.5]. The slurry is controlled by adjusting the viscosity characteristic to the above requirement.
ST **secondary battery carbonaceous** anode slurry viscosity characteristic **control**
IT **Battery** anodes
(slurries with **controlled** viscosity characteristics in **carbonaceous** anodes for **secondary** batteries)
IT Butadiene rubber, uses
Natural rubber, uses
Nitrile rubber, uses
Styrene-butadiene rubber, uses
RL: DEV (Device component use); USES (Uses)
(slurries with controlled viscosity characteristics in **carbonaceous** anodes for **secondary** batteries)
IT 9003-17-2
RL: DEV (Device component use); USES (Uses)
(butadiene rubber, slurries with controlled viscosity characteristics in **carbonaceous** anodes for **secondary** batteries)
IT 9003-18-3
RL: DEV (Device component use); USES (Uses)
(nitrile rubber, slurries with controlled viscosity characteristics in **carbonaceous** anodes for **secondary** batteries)
IT **7782-42-5, Graphite**, uses 9003-04-7, Sodium **polyacrylate** 9004-32-4, Sodium carboxymethylcellulose 9004-62-0, Hydroxyethyl cellulose 9005-37-2, Propylene glycol alginate 9005-38-3, Sodium alginate 106107-54-4, SBS
RL: DEV (Device component use); USES (Uses)
(slurries with controlled viscosity characteristics in **carbonaceous** anodes for **secondary** batteries)
IT 9003-55-8
RL: DEV (Device component use); USES (Uses)
(styrene-butadiene rubber, slurries with controlled viscosity

characteristics in **carbonaceous** anodes for **secondary** batteries)

L36 ANSWER 9 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:510424 CAPLUS
DN 139:55543
ED Entered STN: 04 Jul 2003
TI **Polymer** electrolyte, and **secondary nonaqueous** electrolyte **battery**
IN Okamoto, Tomohito; Kitano, Shinya
PA Japan Storage Battery Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS C08F214-22
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003187870	A2	20030704	JP 2001-384090	20011218
PRAI	JP 2001-384090		20011218		

AB The electrolyte has an electrolyte solution retained in a **polymer** material; where the **polymer** material is a copolymer formed by copolymn. of monomers containing vinylidene fluoride, tetrafluoroethylene and hexafluoropropylene;, and the content of tetrafluoroethylene unit is 5-30 % of the total monomer units. The battery has a cathode, an anode, and the above electrolyte.
ST **secondary** battery electrolyte vinylidene fluoride tetrafluoroethylene hexafluoropropylene copolymer
IT Battery electrolytes
Polymer electrolytes
(electrolytes containing electrolyte solns. retained in copolymers with **controlled** monomer amts. for **secondary lithium batteries**)
IT 52627-24-4, Cobalt **lithium** oxide
RL: DEV (Device component use); USES (Uses)
(cathode; electrolytes containing electrolyte solns. retained in copolymers with **controlled** monomer amts. for **secondary lithium batteries**)
IT 96-49-1, Ethylene **carbonate** 616-38-6, Dimethyl **carbonate** **7782-42-5**, **Graphite**, uses
21324-40-3, **Lithium** hexafluorophosphate 25190-89-0, Hexafluoropropylene-tetrafluoroethylene-vinylidene fluoride copolymer
RL: DEV (Device component use); USES (Uses)
(electrolytes containing electrolyte solns. retained in copolymers with **controlled** monomer amts. for **secondary lithium batteries**)

L36 ANSWER 10 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:172050 CAPLUS

DN 138:224144
ED Entered STN: 07 Mar 2003
TI **Secondary nonaqueous** electrolyte **battery**
IN Nakai, Kenji; Koishigawa, Yoshitada; Hironaka, Kensuke
PA Shin-Kobe Electric Machinery Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M004-02; H01M004-58; H01M004-62; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003068282	A2	20030307	JP 2001-372478	20011206
PRAI	JP 2001-180065	A	20010614		

AB The battery has a coiled electrode-separator stack, containing a cathode having an active mass paste comprising a spinel crystal structured **Li** Mn composite oxide, a conductor and a binder on both sides of a collector, a **Li**-intercalating **carbonaceous** anode, and a separator between the electrodes in a battery case; where the coating amount of the oxide on each of the 2 sides of the collector is 80-120 g/m2, and the mass of the conductor and the binder is resp. 10-12 % and 3-5 % of the cathode active mass paste. The battery has high safety while having high capacity and power output.
ST **secondary** battery cathode active mass paste coating amt control; **lithium manganese oxide** cathode conductor binder amt control
IT Battery cathodes
(**Li** Mn oxide cathodes containing conductors and binders with **controlled** amount for **secondary lithium batteries**)
IT **Carbon** black, uses
Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(**Li** Mn oxide cathodes containing conductors and binders with **controlled** amount for **secondary lithium batteries**)
IT **Secondary** batteries
(**lithium**; **Li** Mn oxide cathodes containing conductors and binders with **controlled** amount for **secondary lithium batteries**)
IT **7782-42-5, Graphite**, uses 24937-79-9, PVDF
155472-68-7, **Lithium manganese oxide** (Li1.1Mn1.9O4) 156912-63-9, **Lithium manganese oxide** (Li1.03Mn1.97O4) 172922-65-5, **Lithium manganese oxide** (Li1.06Mn1.94O4) 176979-24-1, **Lithium manganese oxide** (Li1.12Mn1.88O4) 178404-38-1, **Lithium manganese oxide** (Li1.14Mn1.86O4) 500912-83-4, Aluminum **lithium manganese oxide** (Al0.2Li1.04Mn1.76O4) 500912-84-5,

Lithium magnesium **manganese oxide**
(Li1.04Mg0.2Mn1.76O4) 500912-85-6, Chromium **lithium**
manganese oxide (Cr0.2Li1.01Mn1.79O4) 500912-86-7,
Chromium **lithium manganese oxide**
(Cr0.2Li1.04Mn1.76O4) 500912-87-8, Chromium **lithium**
manganese oxide (Cr0.2Li1.1Mn1.7O4) 500912-88-9,
Chromium **lithium manganese oxide**
(Cr0.2Li1.11Mn1.69O4) 500912-89-0, Chromium **lithium**
manganese oxide (Cr0.01Li1.04Mn1.95O4) 500912-90-3,
Chromium **lithium manganese oxide**
(Cr0.3Li1.04Mn1.66O4) 500912-91-4, Chromium **lithium**
manganese oxide (Cr0.33Li1.04Mn1.63O4) 500912-92-5,
Lithium manganese nickel oxide (Li1.04Mn1.76Ni0.2O4) 500912-93-6
500912-94-7 500912-95-8, Cobalt **lithium** magnesium
manganese oxide ((Co,Mg)0.2Li1.01Mn1.79O4)
RL: DEV (Device component use); USES (Uses)
(**Li** Mn oxide cathodes containing conductors and binders with
controlled amount for **secondary lithium**
batteries)

IT 7440-44-0, **Carbon**, uses
RL: DEV (Device component use); USES (Uses)
(amorphous, anode active mass; **Li** Mn oxide cathodes containing
conductors and binders with **controlled** amount for
secondary lithium batteries)

IT 9002-89-5, **Polyvinyl** alcohol
RL: DEV (Device component use); USES (Uses)
(thermosetting plasticizing; **Li** Mn oxide cathodes containing
conductors and binders with **controlled** amount for
secondary lithium batteries)

L36 ANSWER 11 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2004-002586 [01] WPIX
DNN N2004-002308 DNC C2004-001129
TI Non-aqueous **secondary battery** contains anode active
material containing lithium-nickel group and lithium-manganese group
complex oxides and cathode active material containing mixture of
double-layered **graphite** particles.
DC L03 X16 X21
PA (OSAG) OSAKA GAS CO LTD
CYC 1
PI JP 2003282146 A 20031003 (200401)* 12 H01M010-40
ADT JP 2003282146 A JP 2002-86506 20020326
PRAI JP 2002-86506 20020326
IC ICM H01M010-40
ICS H01M002-02; H01M004-02; H01M004-58
AB JP2003282146 A UPAB: 20040102
NOVELTY - A non-aqueous **secondary battery** contains
mixed solvent of ethylene **carbonate** and 50 volume% or more of
ethyl methyl **carbonate.** The anode active material contains a
mixture of lithium nickel group complex oxide and lithium manganese group
complex oxide. The cathode active material contains a mixture of
double-layered **graphite** particles and graphitized mesocarbon

micro-beads, coated with amorphous **carbon.**

DETAILED DESCRIPTION - A non-aqueous **secondary battery** has an anode, a cathode, a separator and a non-aqueous electrolyte containing lithium salt, accommodated in a container. The **battery** has flat-shape with thickness of 12 mm, has volume energy density of 180 **Wh/l** or more and energy capacity of 30 **Wh** or more. The non-aqueous electrolyte contains mixed solvent of ethylene **carbonate** and 50 volume% or more of ethyl methyl **carbonate.** The anode active material contains a mixture of lithium nickel group complex oxide of formula, LiaNibMBcO2, and lithium manganese group complex oxide of formula, LixMn(2-y)MAyO(4+z), where MB = element chosen from cobalt, aluminum and/or manganese, a = 1-1.1, b = more than 0.5 and less than 1, c = more than 0 and less than 0.5, (b+c) = 1, MA = element chosen from magnesium, aluminum, chromium, iron, cobalt and/or nickel, x = 1-1.2 (excluding 1), y = 0-0.1 (excluding 0), and z = -0.3 to +0.3. The cathode active material contains a mixture of double-layered **graphite** particles and graphitized mesocarbon micro-beads, coated with amorphous **carbon.** The face distance (d002) of surface (002) of **graphite** particles by X-ray wide angle diffraction method is 0.34 nm or less. The face distance (d002) of surface (002) of amorphous **carbon** layer measured by X-ray wide angle diffraction method is 0.34 nm or more. The amount of lithium occlusion of cathode active material is 200-255 mAh/1 kg of active material during full charge.

Priority DOC

USE - For power generation.

ADVANTAGE - The non-aqueous **secondary battery** has excellent cycle property, charging and discharging property at low temperature, high volume energy density, and high industrial utility.
Dwg.0/4

FS CPI EPI
FA AB
MC CPI: L03-E01B3; L03-E01B5C
EPI: X16-B01F1; X16-E01C; X16-E01C1; X16-F01; X21-B01

L36 ANSWER 12 OF 68 JICST-EPlus COPYRIGHT 2004 JST on STN

Not Prior Art

AN 1040003408 JICST-EPlus
TI Laminated Thin Li-Ion **Batteries** Using LiNi0.8-yCo0.2AlyO2 Cathode Materials
AU TAKAMI N; INAGAKI H; ISHII H; SARUWATARI H; MATUNO S; FUJITA Y
CS Toshiba Corp., Kawasaki, Jpn
SO Denki Kagaku oyobi Kogyo Butsuri Kagaku, (2003) vol. 71, no. 12, pp. 1162-1167. Journal Code: G0072A (Fig. 14, Ref. 15)
CODEN: EECTFA; ISSN: 1344-3542
CY Japan
DT Journal; Article
LA English
STA New
AB Thermal stability, surface characteristics, and electrode performance for LiNi1-x-yCoxAlyO2-based materials in a 1.5 M LiBF4 ethylene **carbonate**/Γ-butyrolactone (1:2) electrolyte have been investigated in order to develop laminated thin Li-ion **batteries** using LiNi0.8-yCo0.2AlyO2 cathodes. Using a LiNi0.74Co0.2Al0.06O2 cathode with low basicity, the laminated thin Li-ion **batteries** provided

high energy density, long cycle life, and very low swelling. It was demonstrated that the prototype laminated thin Li-ion **battery** with a thickness of 3.8 mm achieved the energy densities of 200 **Wh** /kg and 407 **Wh**/l. The value of pH (definition is in experimental section) for LiNi0.74Co0.2Al0.06O2 should be less than 11 for the practical application because of a long cycle life of 500 cycles and very low swelling at an even high temperature of 85.DEG.C.. Native alkaline impurities in LiNi0.8-yCo0.2AlyO2 led to CO2 gas evolution and cycle degradation. The results of impedance and x-ray photoelectron spectroscopy measurements for LiNi0.74Co0.2Al0.06O2 and LiCoO2 indicated that the surface film formation on LiNi0.74Co0.2Al0.06O2 cathode is more inactive and thermally stable than that of LiCoO2 cathode. The films formation on LiNi0.8-yCo0.2AlyO2 cathode suppressed further oxidation of the electrolyte and the gas evolution at high-temperature condition. (author abst.)

CC YB04030K; CD01030Z (621.355; 546-36+546.3-31)

CT lithium compound; nickel compound; cobalt compound; aluminum compound; oxide; fluoroborate; **carbon** dioxide; lithium secondary **battery**; electrode material; laminate structure; positive electrode; electrolytic solution(electrochemistry); thermal stability; energy density; temperature dependence; cycle life; gas release; degradation; charge-discharge cycle; **battery** capacity; impedance spectrum; X-ray photoelectron spectroscopy; differential scanning calorimetry; hydrogen ion concentration; lactone

BT alkali **metal** compound; iron group element compound; transition **metal** compound; 3B group element compound; chalcogenide; oxygen group element compound; oxygen compound; fluoro acid; halogeno acid; halide; halogen compound; fluoride; fluorine compound; boron oxyacid derivative; boron compound; **carbon** oxide; **carbon** compound; **carbon** group element compound; secondary **battery**; chemical cell; **battery**; electric material; material; multistory structure; structure; electrode; electrolytic solution; solution(liquid); liquid; stability; density; dependence; lifetime; emission; alteration; variation; cycle; capacity; spectrum; photoelectron spectroscopy; electron spectroscopy; spectroscopy; calorimetry; measurement; acidity; degree; concentration(ratio); carboxylate(ester); ester; oxygen heterocyclic compound; heterocyclic compound

ST pH

L36 ANSWER 13 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:773880 CAPLUS
DN 137:297339
ED Entered STN: 11 Oct 2002
TI Nonaqueous **secondary** electric **battery**
IN Kato, Shiro; Kinoshita, Hajime; Yata, Shizukuni; Kikuta, Haruo
PA Osaka Gas Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40

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     ICS  H01M002-02
CC   52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
     Section cross-reference(s): 76
FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.   DATE
     ---------------   ----  --------      ---------------   --------
PI   JP 2002298916     A2    20021011      JP 2001-93610     20010328
PRAI JP 2001-93610           20010328
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AB The **battery** is characterized by having a flat shape of ≤12 mm thickness with a volume energy d. of 180 **Wh/ L** and a capacity of ≥30 **Wh.** The **battery** has a pos. electrode, a neg. electrode, and a gel or solid nonaq. electrolyte containing Li salt. The atmospheric pressure inside the **battery** cell is 8.66 x 104 Pa. The neg. electrode contains a material which is capable of doping and dedoping of Li. The pos. electrode contains manganese oxide. The thickness of the cell container is ≥0.2 mm. The **battery** eliminates the electrolyte leaking.

Not Priority Doc

ST nonaq **secondary** elec **battery** lithium salt
IT **Secondary batteries**
(nonaq. **secondary** elec. **battery** using lithium salt)
IT **Carbon** black, uses
Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. **secondary** elec. **battery** using lithium salt)
IT 78-67-1 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 872-50-4, N-Methylpyrrolidone, uses 7440-44-0, **Carbon**, uses 7440-50-8, Copper, uses 24937-79-9, **Poly** -vinylidene fluoride 28158-16-9, **Polyethylene** diacrylate 210767-01-4, Lithium manganese oxide (LiMn2O2)
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. **secondary** elec. **battery** using lithium salt)

L36 ANSWER 14 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:752554 CAPLUS
DN 137:265703
ED Entered STN: 04 Oct 2002
TI Flat **secondary** nonaqueous-electrolyte **battery** with long cycle life and high safety
IN Kuriyama, Kazuya; Okano, Yukiko; Yata, Shizukuni; Kikuta, Haruo
PA Osaka Gas Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-58
ICS H01M002-02; H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

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FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.   DATE
     ---------------   ----  --------      ---------------   --------
PI   JP 2002289193     A2    20021004      JP 2001-90612     20010327
PRAI JP 2001-90612           20010327
```

AB The **battery** has thickness <12 mm, energy capacity ≥30
Wh, and volume energy d. ≥180 **Wh/l.** The
battery contains (1) a mixture of Li-Mn mixed oxide represented by
LixMn2-yMAyO4+z (MA = Mg, Al, Cr, Fe, Co, and/or Ni; 1 < x ≤ 1.2; 0
< y ≤ 0.1; z = -0.3-0.3) and Li-Ni mixed oxide represented by
LiaNibMBcO2 (MB = Co, Al, and/or Mn; a = 1-1.1; 0.5 < b < 1; 0 < c < 0.5;
b + c = 1) as cathode active mass, (2) a mixture of graphitized mesocarbon
microbeads and **graphite** particles coated with an amorphous C
layer, where the **graphite** has lattice spacing in (002) plane
(d002) ≤0.34 nm and the amorphous C layer has lattice spacing >0.34
nm in X-ray wide-angle diffraction pattern, and (3) nonaq. electrolyte
containing disulfide derivs.

ST flat nonaq **battery** long cycle life high safety; lithium
manganese nickel oxide cathode **battery**; mesocarbon microbead
graphite carbon coating anode **battery**;
disulfide deriv nonaq electrolyte **battery**

IT **Battery** anodes
Battery cathodes
Battery electrolytes
(flat nonaq.-electrolyte **battery** with long cycle life and
high capacity, energy d., and safety)

IT 7782-42-5, **Graphite**, uses 462114-58-5, OPCG-K
RL: DEV (Device component use); USES (Uses)
(anode active mass; flat nonaq.-electrolyte **battery** with long
cycle life and high capacity, energy d., and safety)

IT 362666-83-9, Aluminum lithium manganese oxide (Al0.1Li1.1Mn1.8O4)
462058-47-5, Cobalt lithium nickel oxide (Co0.2LiNi1.8O2)
RL: DEV (Device component use); USES (Uses)
(cathode active mass; flat nonaq.-electrolyte **battery** with
long cycle life and high capacity, energy d., and safety)

IT 5335-87-5, Bis(4-methoxyphenyl) disulfide
RL: DEV (Device component use); USES (Uses)
(flat nonaq.-electrolyte **battery** with long cycle life and
high capacity, energy d., and safety)

IT 7440-44-0, Mesocarbon microbeads, uses
RL: DEV (Device component use); USES (Uses)
(graphitized, anode active mass; flat nonaq.-electrolyte
battery with long cycle life and high capacity, energy d., and
safety)

L36 ANSWER 15 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:714435 CAPLUS
DN 137:250262
ED Entered STN: 20 Sep 2002
TI **Secondary** lithium **battery**
IN Morikawa, Takamoto; Eda, Nobuo; Nitta, Yoshiaki; Ukaji, Masaya; Kuranaka,
Satoshi
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese

IC ICM H01M010-40
ICS H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002270225	A2	20020920	JP 2001-66336	20010309
PRAI	JP 2001-66336		20010309		

AB The **battery**, having a volume capacity d. ≥400 **Wh/ L**, has a Li Co oxide based cathode, a **graphite** based anode, a porous **polymer** membrane between the electrodes, and a nonaq. electrolyte, with (Vx+0.4Vy) ≤Q ≤(Vx+0.8Vy), where Q = total volume of the electrolyte in the **battery**, Vx = total hole volume in anode, cathode and membrane, and Vy = total void between the electrode stack and the **battery** case and between the separator and the electrodes in the stack.
ST high capacity limit space compact lithium **secondary battery**
IT **Secondary batteries**
(lithium; lithium **secondary batteries** containing high volume capacity d. with limited unuseful spaces)

L36 ANSWER 16 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:693351 CAPLUS
DN 137:204005
ED Entered STN: 13 Sep 2002
TI **Secondary nonaqueous**-electrolyte **battery** with active mass layer having **controlled** porosity
IN Hara, Kenji; Suzuki, Katsunori; Hironaka, Kensuke
PA Shin-Kobe Electric Machinery Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M004-02; H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002260633	A2	20020913	JP 2001-53334	20010228
PRAI	JP 2001-53334		20010228		

AB The title battery is equipped with a cathode active mass containing average grain size 5-20 μm **Li** Mn mixed oxide, a **graphite**-based conducting agent, and a binder coated on both sides of a current collector, where the active mass layer has pore volume 25-35% vs. the active mass volume Alternatively, title battery is equipped with an anode active mass containing average grain size 5-20 μm amorphous C, a conducting agent, and a binder coated on both sides of a current collector, where the active mass layer has pore volume 30-40% vs. the active mass volume The battery

provides high power output at low temperature and safety.
ST **lithium manganese oxide** cathode porosity
battery safety; **carbon** anode porosity **secondary**
nonaq battery
IT **Carbon** black, uses
RL: DEV (Device component use); USES (Uses)
(anode conductor; **secondary nonaq.**-electrolyte
battery with active mass layer having **controlled**
porosity)
IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(binder; **secondary nonaq.**-electrolyte
battery with active mass layer having **controlled**
porosity)
IT **Secondary batteries**
(**lithium**; **secondary nonaq.**-electrolyte
battery with active mass layer having **controlled**
porosity)
IT **Battery** anodes
Battery cathodes
Porosity
Safety
(**secondary nonaq.**-electrolyte **battery**
with active mass layer having **controlled** porosity)
IT 7440-44-0, **Carbon**, uses
RL: DEV (Device component use); USES (Uses)
(amorphous, anode; **secondary nonaq.**-electrolyte
battery with active mass layer having **controlled**
porosity)
IT 24937-79-9, **Polyvinylidene** fluoride
RL: DEV (Device component use); USES (Uses)
(binder; **secondary nonaq.**-electrolyte
battery with active mass layer having **controlled**
porosity)
IT **7782-42-5**, **Graphite**, uses
RL: DEV (Device component use); USES (Uses)
(cathode conductor; **secondary nonaq.**-electrolyte
battery with active mass layer having **controlled**
porosity)
IT 12057-17-9, **Lithium manganese oxide**
(LiMn2O4)
RL: DEV (Device component use); USES (Uses)
(cathode; **secondary nonaq.**-electrolyte
battery with active mass layer having **controlled**
porosity)

L36 ANSWER 17 OF 68 CAPLUS
AN 2002:464549 CAPLUS
DN 137:35511
ED Entered STN: 21 Jun 2002
TI Anode and **secondary nonaqueous** electrolyte
battery

IN   Monma, Shun; Hasebe, Hiroyuki; Sakurai, Katsuyuki; Sato, Asako
PA   Toshiba Corp., Japan
SO   Jpn. Kokai Tokkyo Koho, 11 pp.
     CODEN: JKXXAF
DT   Patent
LA   Japanese
IC   ICM H01M004-02
     ICS H01M004-58; H01M010-40
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002175802	A2	20020621	JP 2000-370305	20001205
PRAI	JP 2000-370305		20001205		

AB   The anodes has a collector coated with an active mass layer containing active mass particles and **resin** bonded active mass particles. The active mass is preferably a **carbonaceous** material having average particle diameter 0.1-50 μm, and the bonded particles have average particle diameter 10-500 μm.
ST   **secondary nonaq battery** anode
     carbonaceous resin particle
IT   Battery anodes
     Particle size
        (anodes from **graphite** particles with and without **resin** binders with **controlled** average diams. for **secondary lithium batteries**)
IT   Styrene-butadiene rubber, uses
     RL: DEV (Device component use); USES (Uses)
        (anodes from **graphite** particles with and without **resin** binders with **controlled** average diams. for **secondary lithium batteries**)
IT   **7782-42-5, Graphite**, uses
     RL: DEV (Device component use); USES (Uses)
        (anodes from **graphite** particles with and without **resin** binders with **controlled** average diams. for **secondary lithium batteries**)
IT   9003-55-8
     RL: DEV (Device component use); USES (Uses)
        (styrene-butadiene rubber, anodes from **graphite** particles with and without **resin** binders with **controlled** average diams. for **secondary lithium batteries**)

L36 ANSWER 18 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN   2003-123212 [12]   WPIX
DNN N2003-098103   DNC C2003-032154
TI   Non-aqueous **secondary battery** for electric vehicle sets lamination thickness of **metal** plate with **resin** layers to prescribed value.
DC   A85 L03 X16 X21
PA   (OSAG) OSAKA GAS CO LTD
CYC 1
PI   JP 2002246068   A 20020830 (200312)*   9   H01M010-40

ADT JP 2002246068 A JP 2001-38157 20010215
PRAI JP 2001-38157 20010215
IC ICM H01M010-40
ICS H01M002-02; H01M002-30
AB JP2002246068 A UPAB: 20030218
NOVELTY - The non-aqueous **secondary battery** has thickness and energy density of 12mm or less and 180 **Whs/l** or more respectively. The lamination thickness of the **metal** plate (53) having a **resin** layers (51a,51b) of thickness of 0.1mm or more and provided in **battery** container, is set less than 1mm. The pressure in the **battery** container is less than atmospheric pressure.

USE - For electric vehicle.

ADVANTAGE - Attains weight reduction, thereby achieving a high energy density, since the lamination of the **metal** plate containing a **resin** layer is set to prescribed thickness.

DESCRIPTION OF DRAWING(S) - The figure shows a sectional drawing of the **battery** container of the **battery.** (Drawing includes non-English language text).

Resin layers 51a,51b
Metal plate 53
Dwg.3/6
FS CPI EPI
FA AB; GI
MC CPI: A12-E06; L03-E01D1
EPI: X16-B01F; X16-F01; X16-F03; X21-A01F; X21-B01A

L36 ANSWER 19 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-387483 [42] WPIX
DNN N2002-303610 DNC C2002-109420
TI Non-aqueous electrolyte **secondary battery** for electronic devices has preset ratio of thickness of anode to separator, ratio of thickness of cathode to separator, and ratio of thickness of **battery** to electrode group.
DC L03 X16
PA (TOKE) TOSHIBA KK
CYC 1
PI JP 2002050402 A 20020215 (200242)* 11 H01M010-40
ADT JP 2002050402 A JP 2000-233135 20000801
PRAI JP 2000-233135 20000801
IC ICM H01M010-40
ICS H01M004-02
AB JP2002050402 A UPAB: 20020704
NOVELTY - The non-aqueous electrolyte **secondary battery** has an electrode group (2) covered by a covering (1) and impregnated with a non-aqueous electrolyte, and has a thickness of 0.5-6 mm. The group (2) has a separator between a cathode and a anode. Ratio of thickness of anode to separator is 7-20 microns , ratio of thickness of cathode to separator is 6-16 microns , and ratio of thickness of **battery** to group (2) is 0.36-0.6.

USE - For electronic devices such as a video tape recorder, a mobile telephone and a mobile computer.

ADVANTAGE - The non-aqueous electrolyte **secondary battery** has high energy density (weight energy density of 170 **Wh**/Kg and volume energy density of 320 **Wh/L**), and excellent charging and discharging cycle characteristics.

DESCRIPTION OF DRAWING(S) - The figure shows the sectional drawing of the non-aqueous electrolyte **secondary battery.**
(Drawing includes non-English language text).
Covering 1
Electrode group 2
Dwg.1/4

FS CPI EPI
FA AB; GI
MC CPI: L03-E01B8A; L03-E01C2
EPI: X16-B01F; X16-E01; X16-E01C

L36 ANSWER 20 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:579601 CAPLUS
DN 137:372408
ED Entered STN: 05 Aug 2002
TI **Polymer battery** R & D in the US
AU Brodd, Ralph J.
CS Broddarp of Nevada, Henderson, NV, USA
SO Dianyuan Jishu (2002), 26(3), 165-171
CODEN: DIJIFT; ISSN: 1002-087X
PB Dianyuan Jishu Bianjibu
DT Journal; General Review
LA Chinese
CC 52-0 (Electrochemical, Radiational, and Thermal Energy Technology)
AB This review with refs. on activities relating to the fundamental understanding of the ionic transference in **polymer** electrolytes, the composition of the SEI layer as well as new pure **polymer** electrolytes. New cathode and anode materials, such as low cost iron phosphate and lithium-tin alloy systems, offer potential for significantly improved performance. The **polymer** systems take advantage of new packaging concepts and internal bonding to give them superior weight and footprint. Several new approaches to develop new high-energy systems, such as the lithium-sulfur **polymer** cells, are underway. These offer the promise of reaching 500 **Wh/L** and 400 **Wh**/kg in the next several years.
ST review **polymer** electrolytes lithium **secondary battery**
IT **Polymer** electrolytes
(lithium **secondary battery**)
IT **Secondary batteries**
(lithium; **polymer** electrolytes)

L36 ANSWER 21 OF 68 JICST-EPlus COPYRIGHT 2004 JST on STN
AN 1020233256 JICST-EPlus
TI Development of High-performance Lithium-ion **Polymer Battery.**
AU KONO KENJI; KATAYAMA YOSHIHIRO; HARADA TAIZO
CS Yuasa Corp., JPN

SO Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku (IEIC Technical Report (Institute of Electronics, Information and Communication Enginners)), (2002) vol. 101, no. 547(EE2001 35-45), pp. 35-39. Journal Code: S0532B (Fig. 12, Tbl. 2, Ref. 3)
CY Japan
DT Journal; Article
LA Japanese
STA New
AB A lithium-ion **polymer battery** with a multifunctional separator has been developed. This multifunctional separator is constituted of a **polymer** gel porous matrix that is arranged on the surface and the inside of a polyolefin porous film as substrate. The separator shows an ability to absorb liquid electrolyte very well. High ionic conductivity, high retention of electrolyte, low liquid leakage and shutdown-capability is obtained with the separator. The **battery** with the developed separator shows performance of 350 **Wh/ l** and 160Wh/kg, and good cycle life. (author abst.)
CC YB04030K (621.355)
CT lithium secondary **battery**; polyelectrolyte; portable telephone; energy density; diaphragm(membrane); polyolefin; **polymer** membrane; charge-discharge cycle; cycle life; **battery** capacity
BT secondary **battery**; chemical cell; **battery**; functional **polymer**; macromolecule; electrolyte; matter; mobile communication; telecommunication; telephone; voice communication; density; membrane and film; **polymer**; thermoplastic; plastic; cycle; lifetime; capacity

L36 ANSWER 22 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 3
AN 2001:657687 CAPLUS
DN 135:229348
ED Entered STN: 07 Sep 2001
TI Heat-resistant nonaqueous electrolyte **secondary batteries** for power storage
IN Kato, Shiro; Yata, Shizukuni; Kikuta, Haruo
PA Osaka Gas Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M002-16
ICS H01M002-16; H01M002-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 40
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001243936	A2	20010907	JP 2000-54189	20000229
PRAI	JP 2000-54189		20000229		

AB The **batteries** are flat-shaped, have energy capacity ≥30 **Wh**, have volume energy d. ≥180 **Wh/L**, and comprise ≥1 separators showing ≤5% shrinkage in their planar directions at 150°. The separators may comprise cellulosic **polymers**, **polyesters**, **polyamides**,

polyphenylene sulfides, fluoropolymers, and/or inorg. fibers. Internal short circuit is prevented.

ST nonaq electrolyte **secondary** lithium **battery** separator; heat shrinkproof separator **secondary** lithium **battery**

IT Fibers
RL: DEV (Device component use); USES (Uses)
(cellulosic, separator; heat-resistant nonaq. electrolyte **secondary batteries** with heat shrink-resistant separators)

IT Heat-resistant materials
Secondary battery separators
(heat-resistant nonaq. electrolyte **secondary batteries** with heat shrink-resistant separators)

IT Synthetic fibers
RL: DEV (Device component use); USES (Uses)
(inorg. separators; heat-resistant nonaq. electrolyte **secondary batteries** with heat shrink-resistant separators)

IT Fluoropolymers, uses
Polyamides, uses
Polyesters, uses
Polythiophenylenes
RL: DEV (Device component use); USES (Uses)
(separator; heat-resistant nonaq. electrolyte **secondary batteries** with heat shrink-resistant separators)

IT 358787-62-9, TF 4030
RL: DEV (Device component use); USES (Uses)
(separator; heat-resistant nonaq. electrolyte **secondary batteries** with heat shrink-resistant separators)

L36 ANSWER 23 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:168300 CAPLUS
DN 134:210511
ED Entered STN: 09 Mar 2001
TI All-solid-state electrochemical device and method of manufacturing
IN Munshi, M. Zafar A.
PA Lithium Power Technologies, Inc., USA
SO PCT Int. Appl., 51 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M010-40
ICS H01G009-02; H01B001-12
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	---------------	----	--------	---------------	--------
PI	WO 2001017052	A2	20010308	WO 2000-US22917	20000821
	WO 2001017052	A3	20020221		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,

LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU,
ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ,
CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

	US 6664006	B1	20031216	US 1999-388733	19990902
	TW 521450	B	20030221	TW 2000-89116078	20000810
	JP 2003508887	T2	20030304	JP 2001-520497	20000821
PRAI	US 1999-388733	A	19990902		
	WO 2000-US22917	W	20000821		

AB All-solid-state electrochem. cells and **batteries** employing very thin film, highly conductive **polymeric** electrolyte and very thin electrode structures are disclosed, along with economical and high-speed methods of manufacturing A preferred embodiment is a rechargeable lithium **polymer** electrolyte **battery.** New **polymeric** electrolytes employed in the devices are strong yet flexible, dry and non-tacky. The new, thinner electrode structures have strength and flexibility characteristics very much like thin film capacitor dielec. material that can be tightly wound in the making of a capacitor. A wide range of **polymers**, or **polymer** blends, characterized by high ionic conductivity at room temperature, and below, are used as the **polymer** base material for making the solid **polymer** electrolytes. The preferred **polymeric** electrolyte is a cationic conductor. In addition to the **polymer** base material, the **polymer** electrolyte compns. exhibit a conductivity greater than 1 x 10-4 S/cm at 25° or below and contain an elec. conductive **polymer**, a **metal** salt, a finely divided ionic conductor, and a finely divided inorg. filler material. Certain rechargeable **batteries** of the invention provide high specific energy (250 to 350 **Wh**/kg) (gravimetric) and energy d. (450 to 550 **Wh/L**) (volumetric), high cycle life (1000 cycles), low self-discharge and improved safety.

ST lithium **polymer** electrolyte **battery**; safety lithium **polymer** electrolyte **battery**

IT Conducting **polymers**
(Li-doped; all-solid-state electrochem. device and method of manufacturing)

IT **Battery** electrolytes
Ionic conductors
Polymer electrolytes
Polymer networks
(all-solid-state electrochem. device and method of manufacturing)

IT Acrylic **polymers**, uses
Fluoropolymers, uses
Oxides (inorganic), uses
Polyacetylenes, uses
Polyanilines
Polycarbonates, uses
Polyesters, uses
Polymers, uses
Polyoxyalkylenes, uses
Polysiloxanes, uses

Polythiophenylenes
Selenides
Sulfides, uses
RL: DEV (Device component use); USES (Uses)
(all-solid-state electrochem. device and method of manufacturing)
IT Silicates, uses
RL: MOA (Modifier or additive use); USES (Uses)
(all-solid-state electrochem. device and method of manufacturing)
IT **Polymers**, uses
RL: DEV (Device component use); USES (Uses)
(co-; all-solid-state electrochem. device and method of manufacturing)
IT **Secondary batteries**
(lithium; all-solid-state electrochem. device and method of manufacturing)
IT 1313-13-9, Manganese oxide mno2, uses 1314-35-8, Tungsten trioxide, uses 1314-62-1, Vanadia, uses 1344-28-1, Alumina, uses 7439-93-2, Lithium, uses 7439-93-2D, Lithium, salt, uses 7439-95-4, Magnesium, uses 7440-09-7, Potassium, uses 7440-23-5, Sodium, uses 7440-66-6, Zinc, uses 7440-70-2, Calcium, uses 7791-03-9, Lithium perchlorate 9002-83-9, **Poly**(chlorotrifluoroethylene) 9002-85-1, Ethene, 1,1-dichloro-, homopolymer 9003-07-0, **Polypropylene** 9010-79-1D, Ethylene-propylene copolymer, fluorinated 9011-14-7, Pmma 9020-32-0 9020-73-9, **Polyethylene** naphthalate 12017-00-4, Cobalt oxide coo2 12034-78-5, Niobium selenide nbse3 12036-21-4, Vanadium oxide vo2 12039-13-3, Titanium disulfide 12057-17-9, Lithium manganese oxide (limn2o4) 12137-52-9, Vanadium oxide v3o8 12138-17-9, Vanadium sulfide v2s5 12158-49-5, Chromium oxide cr3o8 12218-36-9, Chromium oxide cr2o5 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 24937-79-9, Pvdf 25014-41-9, **Polyacrylonitrile** 25067-58-7, **Polyacetylene** 25067-61-2, **Polymethacrylonitrile** 25101-45-5, Ethylene-chlorotrifluoroethylene copolymer 25233-30-1, **Polyaniline** 25322-68-3, Peo 29935-35-1, Lithium hexafluoroarsenate 30604-81-0, **Polypyrrole** 33454-82-9, Lithium triflate 39300-70-4, Lithium nickel oxide 90076-65-6 131344-56-4, Cobalt lithium nickel oxide 132404-42-3 162684-16-4, Lithium manganese nickel oxide 214536-41-1, Cobalt Lithium manganese oxide 329028-78-6 329028-80-0
RL: DEV (Device component use); USES (Uses)
(all-solid-state electrochem. device and method of manufacturing)
IT 25038-59-9, **Polyethylene** terephthalate, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(all-solid-state electrochem. device and method of manufacturing)
IT 7631-86-9, Fumed silica, uses
RL: DEV (Device component use); USES (Uses)
(colloidal; all-solid-state electrochem. device and method of manufacturing)
IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-44-0, **Carbon**, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 12597-68-1, Stainless steel, uses 12606-02-9, Inconel
RL: DEV (Device component use); USES (Uses)
(current collector; all-solid-state electrochem. device and method of manufacturing)

IT   37220-89-6, Lithium β alumina
     RL: MOA (Modifier or additive use); USES (Uses)
        (β-type; all-solid-state electrochem. device and method of
        manufacturing)

L36 ANSWER 24 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN   2001:168299 CAPLUS
DN   134:210510
ED   Entered STN: 09 Mar 2001
TI   Solid **polymer** electrolytes
IN   Munshi, M. Zafar A.
PA   Lithium Power Technologies, Inc., USA
SO   PCT Int. Appl., 52 pp.
     CODEN: PIXXD2
DT   Patent
LA   English
IC   ICM H01M010-40
     ICS H01G009-02; H01B001-12; H01M004-04
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
     Section cross-reference(s): 38, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001017051	A1	20010308	WO 2000-US22915	20000821
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6645675	B1	20031111	US 1999-388741	19990902
	EP 1224706	A1	20020724	EP 2000-957626	20000821
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
	JP 2003508886	T2	20030304	JP 2001-520496	20000821
PRAI	US 1999-388741	A	19990902		
	WO 2000-US22915	W	20000821		

AB   A wide range of solid **polymer** electrolytes characterized by high ionic conductivity at room temperature, and below, are disclosed. These all-solid-state **polymer** electrolytes are suitable for use in electrochem. cells and **batteries.** A preferred **polymer** electrolyte is a cationic conductor which is flexible, dry, non-tacky, and lends itself to economical manufacture in very thin film form. Solid **polymer** electrolyte compns. which exhibit a conductivity of at least approx. 10-3-10-4 S/cm at 25° comprise a base **polymer** or **polymer** blend containing an elec. conductive **polymer**, a **metal** salt, a finely divided inorg. filler material, and a finely divided ion conductor. The new solid **polymer** electrolytes are combinable with various neg. electrodes such as an alkali **metal**,

alkaline earth **metal**, transition **metal**, ion-insertion
polymers, ion-insertion inorg. electrodes, **carbon**
insertion electrodes, tin oxide electrode, among others, and various pos.
electrodes such as ion-insertion **polymers** and ion-insertion
inorg. electrodes to provide **batteries** and supercapacitors
having high specific energy (**Wh**/kg) (gravimetric) and energy d.
(**Wh/L**) (volumetric), high cycle life, low
self-discharge and providing improved safety.

ST **battery** electrolyte solid **polymer**; safety
battery electrolyte solid **polymer**; supercapacitor
electrolyte solid **polymer**

IT **Polymers**, uses
RL: DEV (Device component use); USES (Uses)
(block; manufacture of solid **polymer** electrolytes for electrochem.
cells)

IT **Polymers**, uses
RL: DEV (Device component use); USES (Uses)
(co-; manufacture of solid **polymer** electrolytes for electrochem.
cells)

IT Phosphate glasses
Sulfide glasses
RL: TEM (Technical or engineered material use); USES (Uses)
(ion conductor; manufacture of solid **polymer** electrolytes for
electrochem. cells)

IT **Secondary batteries**
(lithium; manufacture of solid **polymer** electrolytes for
electrochem. cells)

IT **Battery** electrolytes
Ionic conductors
Polymer electrolytes
Polymer networks
(manufacture of solid **polymer** electrolytes for electrochem. cells)

IT Acrylic **polymers**, uses
Fluoropolymers, uses
Polycarbonates, uses
Polyesters, uses
Polymers, uses
Polyoxyalkylenes, uses
Polysiloxanes, uses
Polythiophenylenes
RL: DEV (Device component use); USES (Uses)
(manufacture of solid **polymer** electrolytes for electrochem. cells)

IT Capacitors
(supercapacitors; manufacture of solid **polymer** electrolytes for
electrochem. cells)

IT 7631-86-9, Fumed silica, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(colloidal, filler; manufacture of solid **polymer** electrolytes for
electrochem. cells)

IT 1344-28-1, Alumina, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(filler; manufacture of solid **polymer** electrolytes for

electrochem. cells)
IT 10377-51-2, Lithium iodide 12007-33-9, Boron sulfide b2s3 12136-58-2, Lithium sulfide li2s
RL: DEV (Device component use); USES (Uses)
(glass; manufacture of solid **polymer** electrolytes for electrochem. cells)
IT 12627-14-4, Lithium silicate 184905-46-2, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(ion conductor; manufacture of solid **polymer** electrolytes for electrochem. cells)
IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, complex with **polymer**, uses 9002-83-9, **Poly**(chlorotrifluoroethylene) 9002-84-0, Ptfe 9002-86-2, **Polyvinyl** chloride 9003-07-0, **Polypropylene** 9010-79-1D, Ethylene-propylene copolymer, fluorinated 9011-14-7, Pmma 24937-79-9, Pvdf 25067-61-2, **Polymethacrylonitrile** 25101-45-5, Ethylene-chlorotrifluoroethylene copolymer 25322-68-3, Peo 132404-42-3
RL: DEV (Device component use); USES (Uses)
(manufacture of solid **polymer** electrolytes for electrochem. cells)
IT 329028-78-6P
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(manufacture of solid **polymer** electrolytes for electrochem. cells)
IT 7439-93-2D, Lithium, salt, uses 7439-95-4D, Magnesium, salt, uses 7440-09-7D, Potassium, salt, uses 7440-23-5D, Sodium, salt, uses 7440-70-2D, Calcium, salt, uses 7791-03-9, Lithium perchlorate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6, Lithiumbis(trifluoromethanesulfonyl)imide
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(manufacture of solid **polymer** electrolytes for electrochem. cells)
IT 329028-80-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of solid **polymer** electrolytes for electrochem. cells)
IT 947-19-3, Irgacure 184
RL: RCT (Reactant); RACT (Reactant or reagent)
(photoinitiator; manufacture of solid **polymer** electrolytes for electrochem. cells)
IT 37220-89-6, Lithium-β-alumina
RL: TEM (Technical or engineered material use); USES (Uses)
(β-type, ion conductor; manufacture of solid **polymer** electrolytes for electrochem. cells)
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Boo-Keun, O; US 6001509 A 1999 CAPLUS
(2) Lithium Technology Corp; WO 9927593 A 1999 CAPLUS
(3) Matsushita Denki Sangyo Kk; JP 07082450 A 1995 CAPLUS
(4) Matsushita Denki Sangyo Kk; PATENT ABSTRACTS OF JAPAN 1995, V195(6)
(5) Matsushita Electric Ind Co Ltd; JP 07082450 A 1995 CAPLUS

(6) Samsung Display Devices Co Ltd; GB 2326269 A 1998 CAPLUS
(7) Sharp Kk; EP 0893836 A 1999 CAPLUS
(8) Sony Corp; EP 0986122 A 2000 CAPLUS

L36 ANSWER 25 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:847740 CAPLUS
DN 136:9008
ED Entered STN: 22 Nov 2001
TI Method for initial charging **secondary nonaqueous** electrolyte **battery**
IN Shibuya, Mashio; Hara, Tomitato; Suzuki, Yusuke; Kita, Akinori
PA Sony Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 20 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M010-40; H01M004-58; H01M010-44
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001325988	A2	20011122	JP 2000-144042	20000516
	CN 1323076	A	20011121	CN 2001-122065	20010516
	US 2002034678	A1	20020321	US 2001-859058	20010516
PRAI	JP 2000-144042	A	20000516		

AB The battery, using an electrolyte solvent mixture containing a main solvent ≥1 auxiliary solvent having reduction potential higher than that of the main solvent, is initially charged by a 2-step charging, where the anode potential during the 1st step is controlled at a level capable of reducing the auxiliary solvent but not the main solvent.
ST anode potential **control secondary battery** initial charge; solvent redn **secondary** battery initial charge anode potential
IT Fluoropolymers, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(controlled anode potential in initial charging of **secondary lithium** batteries containing mixed electrolyte solvents)
IT **Secondary batteries**
(**lithium**; **controlled** anode potential in initial charging of **secondary lithium** batteries containing mixed electrolyte solvents)
IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 108-32-7, Propylene **carbonate** 623-53-0, Ethyl methyl **carbonate** 872-36-6, Vinylene **carbonate** **7782-42-5**, **Graphite**, uses 24937-79-9, **Poly** (vinylidene fluoride) 25014-41-9, **Polyacrylonitrile** 25067-61-2, **Polymethacrylonitrile**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(controlled anode potential in initial charging of **secondary**

lithium batteries containing mixed electrolyte solvents)

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L36  ANSWER 26 OF 68  CAPLUS  COPYRIGHT 2004 ACS on STN
AN   2001:692250  CAPLUS
DN   135:229396
ED   Entered STN:  21 Sep 2001
TI   Secondary nonaqueous electrolyte batteries
     and their manufacture
IN   Ishizaki, Haruaki
PA   Sony Corp., Japan
SO   Jpn. Kokai Tokkyo Koho, 7 pp.
     CODEN: JKXXAF
DT   Patent
LA   Japanese
IC   ICM  H01M010-40
     ICS  H01M004-02; H01M004-04
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1
     PATENT NO.         KIND  DATE          APPLICATION NO.  DATE
     ---------------    ----  --------      ---------------  --------
PI   JP 2001257001       A2   20010921      JP 2000-64401    20000309
PRAI JP 2000-64401            20000309
AB   The batteries use cathodes and anodes having an active mass suspension
     applied on collectors, in a required pattern, where the boundary between
     the suspension coated area and uncoated area is cleaned to have only the
     collector exposed.  The batteries are prepared by using active mass
     suspensions having V/V' ratio = 2-8, where V and V' are the viscosities of
     the suspension measured at shearing rate 1/s and 0.01/s, resp., at
     25°.
ST   secondary nonaq battery manuf electrode
     active mass suspension; electrode active mass suspension viscosity nonaq
     battery
IT   Battery electrodes
        (electrode active mass suspensions with controlled viscosity
        characteristics for secondary lithium
        batteries manufacture)
IT   Fluoropolymers, uses
     RL: DEV (Device component use); USES (Uses)
        (electrode active mass suspensions with controlled viscosity
        characteristics for secondary lithium
        batteries manufacture)
IT   Secondary batteries
        (lithium; electrode active mass suspensions with
        controlled viscosity characteristics for secondary
        lithium batteries manufacture)
IT   872-50-4, N-Methylpyrrolidone, uses   7440-44-0, Carbon, uses
     7782-42-5, Graphite, uses   12190-79-3, Cobalt
     lithium oxide (CoLiO2)   24937-79-9, Poly(vinylidene
     fluoride)
     RL: DEV (Device component use); USES (Uses)
        (electrode active mass suspensions with controlled viscosity
        characteristics for secondary lithium
```

batteries manufacture)

L36 ANSWER 27 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-092544 [13] WPIX
DNN N2002-068245 DNC C2002-028971
TI Non-aqueous **secondary battery** for storage systems, is flat and contains electrolyte containing ethylene **carbonate** and ethylmethyl **carbonate** as non-aqueous solvent.
DC L03 X16
PA (OSAG) OSAKA GAS CO LTD
CYC 1
PI JP 2001243980 A 20010907 (200213)* 8 H01M010-40
ADT JP 2001243980 A JP 2000-54311 20000229
PRAI JP 2000-54311 20000229
IC ICM H01M010-40
ICS H01M002-02
AB JP2001243980 A UPAB: 20020226
NOVELTY - The flat non-aqueous **secondary battery** is equipped with positive electrode, negative electrode and a non-aqueous electrolyte formed by dissolving lithium salt in non-aqueous solvent. The non-aqueous solvent is ethylene **carbonate** (EC) and/or ethylmethyl **carbonate** (EMC). The total volume of EC and EMC is 60 volume% or more. The volume ratio of EMC to EC is 1 or more.

DETAILED DESCRIPTION - The flat non-aqueous **secondary battery** is equipped with positive electrode, negative electrode and a non-aqueous electrolyte formed by dissolving lithium salt in non-aqueous solvent. The non-aqueous solvent is EC and/or EMC. The total volume of EC and EMC is 60 volume% or more. The volume ratio of EMC to EC is 1 or more. The energy capacity and volume energy density of the **battery** are 30 **Wh** or more and 180 **Wh/l** or more.

USE - For storage systems used for electric vehicle, portable machine.

ADVANTAGE - The non-aqueous **secondary battery** excels in low temperature characteristics and heat release characteristics due to electrolyte containing ethylene **carbonate** and/or ethylmethyl **carbonate.** The **battery** has high volume density.

DESCRIPTION OF DRAWING(S) - The figure shows the top view and side view of non-aqueous **secondary battery.**
Container 2
Dwg.1/4
FS CPI EPI
FA AB; GI
MC CPI: L03-E01C2
EPI: X16-B01F; X16-F01

L36 ANSWER 28 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-092533 [13] WPIX
DNN N2002-068234 DNC C2002-028960
TI Non-aqueous **secondary battery** has positive electrode, negative plate of **graphite** active material of specific surface

area, and lithium salt containing non-aqueous electrolyte, and has preset volume energy density.
DC L03 X16
PA (OSAG) OSAKA GAS CO LTD
CYC 1
PI JP 2001243953 A 20010907 (200213)* 8 H01M004-58
ADT JP 2001243953 A JP 2000-54293 20000229
PRAI JP 2000-54293 20000229
IC ICM H01M004-58
ICS H01M002-02; H01M004-62; H01M010-40
AB JP2001243953 A UPAB: 20020226
NOVELTY - A non-aqueous **secondary battery** contains a positive electrode, a negative plate and a lithium salt containing non-aqueous electrolyte, and has an energy density of 30 **Wh** or more and volume energy density of 180 **Wh/l** or more.
The negative plate consists of **graphite** material of specific surface area 5 m2/g or less as active material, and a binder.
DETAILED DESCRIPTION - The negative plate contains the electroconductive material of 1 weight percent (weight%) or less of **graphite** material. The non-aqueous **secondary battery** has a thickness of less than 12 mm, and comprises a **battery** container of thickness 0.2-1 mm.
USE - For electric power storage systems for an electric vehicle, etc.
ADVANTAGE - The non-aqueous **secondary battery** has high volume energy density, capacity, thickness accuracy, and safety, minimum variation of internal resistance, and excellent heat releasing characteristics.
Dwg.1/5
FS CPI EPI
FA AB; GI
MC CPI: L03-E01B3; L03-E01C2
EPI: X16-B01F; X16-E01C; X16-E09; X16-F01

L36 ANSWER 29 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
AN 2001:646012 CAPLUS
DN 135:244846
ED Entered STN: 05 Sep 2001
TI Lithium-ion **batteries** for mobile IT terminals
AU Arai, Hajime; Saito, Keiichi; Tsuda, Masayuki; Shodai, Takahisa
CS Telecommun. Energy Lab., NTT, Japan
SO NTT R&D (2001), 50(8), 581-585
CODEN: NTTDEC; ISSN: 0915-2326
PB Denki Tsushin Kyokai
DT Journal; General Review
LA Japanese
CC 52-0 (Electrochemical, Radiational, and Thermal Energy Technology)
AB A review with 10 refs. Lithium-ion **batteries** have high energy densities and are thus suitable for mobile information technol. (IT) terminals that consume a lot of energy. We studied new electrode materials for Lithium-ion **batteries** to achieve even higher energy d. than before. We found that an amorphous nitride Li2.6Co0.4N

provides twice the specific capacity of conventional **graphite**,
with little decrease in capacity after repeated charge-discharge cycles.
Cylindrical prototype cells (17 mm in diameter, 50 mm high) were developed
with the nitride and $LiNiO_2$ as the neg. and pos. electrodes, resp. The
cell showed the highest energy d. (400 **Wh**.cntdot.**L**-1)
ever reported for **secondary batteries** of this size.
We enhanced the thermal stability of $LiNiO_2$ by partial substitution of
nickel, which helps us develop **batteries** with high safety stds.
We also examined manganese dioxide electrodes that have large capacities and
particularly high thermal stability. By combining these electrode
materials, we can offer **batteries** that are suitable as power
sources for multi-functional mobile IT terminals.

ST review lithium ion **battery** cellular phone; lithium cobalt
nitride **secondary battery** anode review; amorphous
nitride lithium ion **battery** review; cathode lithium nickel oxide
secondary battery review; mobile communication tool
secondary battery review

IT **Battery** anodes
(amorphous LiCoN as **secondary battery** anodes for
mobile communication tools)

IT 174421-80-8, Cobalt lithium nitride ($CO_{0.4}LI_{2.6}N$)
RL: DEV (Device component use); USES (Uses)
(amorphous LiCoN as **secondary battery** anodes for
mobile communication tools)

IT 12031-65-1, Lithium nickel oxide ($LiNiO_2$)
RL: DEV (Device component use); USES (Uses)
(cathodes; amorphous LiCoN as **secondary battery**
anodes for mobile communication tools)

L36 ANSWER 30 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:388602 CAPLUS
DN 135:109664
ED Entered STN: 30 May 2001
TI 18650 size lithium-ion rechargeable **battery** with advanced
performance
AU Zhang, Ze-bo; Liu, Xiu-shang; Xue, Mei; Yang, Qing-xin; Wang, Ji-qiang
CS Tianjin Institute of Power Sources, Tianjin, 300381, Peop. Rep. China
SO Dianyuan Jishu (2001), 25(2), 98-100
CODEN: DIJIFT; ISSN: 1002-087X
PB Dianyuan Jishu Bianjibu
DT Journal
LA Chinese
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB Various electrode materials and electrode processes for lithium-ion
batteries were investigated and tested. The 18650 size
lithium-ion **batteries**, using $LiCoO_2$, $LiNi_{0.8}Co_{0.2}O_2$ as cathode
and MCMB as anode were constructed. The discharge expts. were carried out
at various temps. and current densities. The results show that cells
discharge capacity is over 1550 mAh and 1700 mAh (resp.) and the specific
energy is 130 **Wh**/kg and 350 **Wh**/**L**. The
batteries' cycle life is over 1000 times at room temperature, and
discharge capacity is 60%, 70% of the initial capacity. The discharge

capacity of the **battery** with LiCoO2/MCMB at -40°, 0.2 C,
2.5 V (terminal voltage) is 60% of discharge capacity at room temperature The
safety experiment results show that the **batteries** are safe and
reliable.

ST lithium ion rechargeable **battery**; safety lithium ion
rechargeable **battery**

IT **Secondary batteries**
(lithium; lithium-ion rechargeable **battery** with advanced
performance)

IT 12190-79-3, cobalt lithium oxide colio2 113066-89-0, Cobalt lithium
nickel oxide Co0.2LiNi0.8O2
RL: DEV (Device component use); USES (Uses)
(lithium-ion rechargeable **battery** with advanced performance)

IT 7440-44-0, **Carbon**, uses
RL: DEV (Device component use); USES (Uses)
(mesocarbon microbrads; lithium-ion rechargeable **battery** with
advanced performance)

L36 ANSWER 31 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:474471 CAPLUS
DN 133:91975
ED Entered STN: 14 Jul 2000
TI **Secondary nonaqueous** electrolyte **batteries**
using improved anodes
IN Akagi, Ryuichi; Suzuki, Atsushi
PA Kao Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-62
ICS H01M004-02; H01M004-38; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000195520	A2	20000714	JP 1998-372734	19981228
PRAI	JP 1998-372734		19981228		

AB The batteries have cathodes containing **Li**+-intercalatable active
materials and anodes comprising sintered bodies (BET sp. surface area
1-100 m2/g) from Si (compound) active materials, fired binders, and optional
carbonaceous elec. conductors. The batteries show low
irreversible capacity.

ST nonaq electrolyte battery silicon **carbon** anode; binder silicon
sintered anode **lithium** battery

IT Fluoropolymers, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(binder; **secondary nonaq.** electrolyte **Li**
batteries using surface area-**controlled** sintered Si/C
anodes for low irreversible capacity)

IT **Secondary batteries**

(**lithium**; **secondary nonaq.** electrolyte **Li batteries** using surface area-**controlled** sintered Si/C anodes for low irreversible capacity)

IT **Battery** anodes
Binders
Pitch
(**secondary nonaq.** electrolyte **Li batteries** using surface area-**controlled** sintered Si/C anodes for low irreversible capacity)

IT 282098-25-3, Graphiton
RL: DEV (Device component use); USES (Uses)
(Graphiton; **secondary nonaq.** electrolyte **Li batteries** using surface area-**controlled** sintered Si/C anodes for low irreversible capacity)

IT 24937-79-9, **Poly**(vinylidene fluoride)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(binder; **secondary nonaq.** electrolyte **Li batteries** using surface area-**controlled** sintered Si/C anodes for low irreversible capacity)

IT 7440-21-3, Silicon, uses **7782-42-5**, **Graphite**, uses 282097-96-5, HSB-S
RL: DEV (Device component use); USES (Uses)
(**secondary nonaq.** electrolyte **Li batteries** using surface area-**controlled** sintered Si/C anodes for low irreversible capacity)

L36 ANSWER 32 OF 68 CAPLUS
AN 2000:399098 CAPLUS
DN 133:20115
ED Entered STN: 16 Jun 2000
TI **Secondary batteries** with **polymer solid** electrolyte films
IN Ono, Takayoshi; Ueda, Haruhiko
PA Furukawa Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M004-02; H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000164205	A2	20000616	JP 1998-331647	19981120
PRAI	JP 1998-331647		19981120		

AB The batteries comprise a solid electrolyte film inserted between an anode and a cathode collector, carrying cathode active mass of porosity 32-39%. The electrolyte film mainly consists of crosslinked acrylonitrile-butadiene copolymer, ethylene **carbonate**, linear

carbonate, and alkali **metal** salt. The batteries have excellent rate characteristics and long cycle lifetime.

ST **polymer solid** electrolyte film **secondary battery**; crosslinked acrylonitrile butadiene copolymer battery electrolyte; cathode active material porosity **controlled battery**

IT **Carbon** fibers, uses
RL: DEV (Device component use); USES (Uses)
(BL 924, anode active material; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT **Carbon** black, uses
RL: DEV (Device component use); USES (Uses)
(TB 4300, cathode active material; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT Battery electrolytes
Secondary batteries
(batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(cathode active material; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT **Polymer** electrolytes
(solid electrolyte film treated with; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT Nitrile rubber, uses
RL: DEV (Device component use); USES (Uses)
(solid electrolyte film; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT **Lithium** alloy
RL: DEV (Device component use); USES (Uses)
(anode foil; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT **7782-42-5**, **Graphite**, uses
RL: DEV (Device component use); USES (Uses)
(MAG-B 30, anode active material; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT 7440-44-0, **Carbon**, uses

RL: DEV (Device component use); USES (Uses)
(MBC-NC, amorphous, anode active material; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT 12190-79-3, Cobalt **lithium** oxide ($CoLiO_2$)
RL: DEV (Device component use); USES (Uses)
(NC 5N, cathode active material; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT **7439-93-2**, **Lithium**, uses
RL: DEV (Device component use); USES (Uses)
(anode foil; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT 24937-79-9, **Poly**(vinylidene fluoride)
RL: DEV (Device component use); USES (Uses)
(cathode active material; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT 9003-18-3
RL: DEV (Device component use); USES (Uses)
(nitrile rubber, solid electrolyte film; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT 7791-03-9, **Lithium** perchlorate
RL: DEV (Device component use); USES (Uses)
(solid electrolyte film containing; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT 96-49-1, Ethylene **carbonate** 616-38-6, Methyl **carbonate**
RL: DEV (Device component use); USES (Uses)
(solid electrolyte film treated with; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

IT **7439-93-2D**, **Lithium**, complexes with crosslinked acrylonitrile-butadiene copolymers o, uses 9003-18-3D, Acrylonitrile-butadiene copolymer, crosslinked, **lithium** complexes
RL: DEV (Device component use); USES (Uses)
(solid electrolyte film; batteries with crosslinked acrylonitrile-butadiene copolymer-based solid electrolyte films and cathodes carrying active mass of certain porosity for long cycle lifetime)

L36 ANSWER 33 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2000-642228 [62] WPIX

DNN N2000-476259 DNC C2000-194225
TI Organic electrolyte **battery** for electric power storage system, has lithium salt dissolved in non-aqueous solvent containing ethylene **carbonate**, dimethyl **carbonate** as electrolyte and has specific properties.
DC L03 X16
PA (OSAG) OSAKA GAS CO LTD
CYC 1
PI JP 2000251934 A 20000914 (200062)* 10 H01M010-40
ADT JP 2000251934 A JP 1999-54263 19990302
PRAI JP 1999-54263 19990302
IC ICM H01M010-40
ICS C07C069-96; H01M002-02; H01M004-62
AB JP2000251934 A UPAB: 20001130
NOVELTY - Organic electrolyte **battery** with energy capacity of 30 **Whs** or more, volume energy density of 180 **Whs/l** or more and thickness of less than 12 mm has non-aqueous (NA) electrolyte obtained by dissolving lithium salt in NA solvent (NAS). NAS has at least ethylene **carbonate** (EC), dimethyl **carbonate** (DMC) and a third component. Total weight of EC and DMC contained in weight ratio of 1 or more is 55-90 weight%.

DETAILED DESCRIPTION - An organic electrolyte **battery** with energy capacity of 30 **Whs** or more, volume energy density of 180 **Whs/l** or more and thickness of less than 12 mm is equipped with anode, cathode and non-aqueous electrolyte obtained by dissolving a lithium salt in non-aqueous solvent. The non-aqueous solvent contains at least ethylene **carbonate**, dimethyl **carbonate** and third component. Total weight of ethylene **carbonate** and dimethyl **carbonate** contained in weight ratio of 1 or more is 55-90 weight%.

USE - For electric power storage systems.

ADVANTAGE - The **battery** with high volume density excels in low temperature property, rate property and heat release property.

DESCRIPTION OF DRAWING(S) - The figure shows the top and side view of non-aqueous **secondary battery** for storage system.
Dwg.1/5
FS CPI EPI
FA AB; GI
MC CPI: L03-E01C
EPI: X16-B01F; X16-E09; X16-F01

L36 ANSWER 34 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2000-615101 [59] WPIX
DNN N2000-455687 DNC C2000-184628
TI Alkali **secondary battery** for cordless device has hydrogen absorbing alloy content cathode which is immersed in aqueous potassium hydroxide during magnetization at specific conditions.
DC L03 X16
PA (RAYN) TOSHIBA BATTERY CO LTD
CYC 1
PI JP 2000243434 A 20000908 (200059)* 7 H01M010-30
ADT JP 2000243434 A JP 1999-41390 19990219

PRAI JP 1999-41390 19990219
IC ICM H01M010-30
ICS H01M004-38
AB JP2000243434 A UPAB: 20001117
NOVELTY - The cathode (2) made of hydrogen absorption alloy powder with nickel-rare earth **metal** is immersed in the alkali electrolyte of 0.7-1.3 mL/Ah. The cathode is magnetized under aqueous potassium hydroxide of 8N at 60 deg. C for 48 hrs, to maintain the saturation magnetization between 3.4-9.0 emu/m2.

DETAILED DESCRIPTION - Nickel hydroxide content anode is arranged in opposite to the cathode. Alkali electrolyte of 0.7-1.3 mL/Ah is stored in the container (1). Both anode and cathode are immersed in the electrolyte. The amount of pressure with container at 100 deg. C is 2.0-4.0 atmospheric The total capacity of **battery** is 310 **Wh/L** or more.

USE - E.g. nickel-hydrogen **battery** for cordless device.

ADVANTAGE - Prevents internal pressure variation due to stable pressure control, and thereby variation in discharge capacity is less.

DESCRIPTION OF DRAWING(S) - The figure shows the perspective view of the nickel-hydrogen **secondary battery.**
Container 1
Cathode 2
Dwg.1/1
FS CPI EPI
FA AB; GI
MC CPI: L03-E01B4; L03-E03
EPI: X16-B01A3; X16-E01C

L36 ANSWER 35 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:640856 CAPLUS
DN 133:337588
ED Entered STN: 14 Sep 2000
TI SAFT lithium-ion **polymer battery** technology
AU Raman, N. S.
CS SAFT America Inc, Valdese, NC, 28690, USA
SO Proceedings of the Power Sources Conference (2000), 39th, 346-350
CODEN: PPOCFD
PB National Technical Information Service
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 59, 72
AB SAFT has successfully developed a high energy lithium-ion **polymer** rechargeable **battery** delivering 130 **Wh**/kg and 245 **Wh/l** as energy densities. The electrolyte, prepared by a phase inversion process, consisted of a porous **polymer** matrix filled and swollen by a liquid The electrodes consisted of lithium cobalt oxide ($LiCoO_2$) and **graphite** as intercalation compds. Cells were tested for performance including GSM cycling, power, temperature, and charge retention. Also, cells were subjected to safety testing such as nail penetration, crush, over charge and +160C oven storage. This paper focuses on performance and safety data.

ST lithium ion **polymer battery** safety
IT Safety
(lithium-ion **polymer battery** technol.)
IT **Secondary batteries**
(lithium; lithium-ion **polymer battery** technol.)
IT 7782-42-5, **Graphite**, uses
RL: DEV (Device component use); USES (Uses)
(anode; lithium-ion **polymer battery** technol.)
IT 12190-79-3, Cobalt lithium oxide colio2
RL: DEV (Device component use); USES (Uses)
(cathode; lithium-ion **polymer battery** technol.)
IT 9002-85-1, **Polyvinylidene** chloride
RL: DEV (Device component use); USES (Uses)
(electrolyte; lithium-ion **polymer battery** technol.)

AN 1999:753469 CAPLUS
DN 131:353691
ED Entered STN: 26 Nov 1999
TI **Secondary nonaqueous** electrolyte **batteries**
and **battery control** method
IN Yata, Shizukuni; Kikuta, Haruo; Kinoshita, Hajime; Tajiri, Hiroyuki; Kato, Shiro
PA Osaka Gas Company Limited, Japan
SO PCT Int. Appl., 89 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M004-02; H01M004-58; H01M002-16; H01M010-42
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9960652	A1	19991125	WO 1999-JP2658	19990520
	W: AE, AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GD, GE, HR, HU, ID, IL, IN, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, SL, TR, TT, UA, US, UZ, VN, YU, ZA, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	CA 2332452	AA	19991125	CA 1999-2332452	19990520
	AU 9938501	A1	19991206	AU 1999-38501	19990520
	EP 1083618	A1	20010314	EP 1999-921204	19990520
	R: DE, FR, GB				
	US 2004048152	A1	20040311	US 2003-637450	20030808
PRAI	JP 1998-138347	A	19980520		
	JP 1998-165373	A	19980612		
	JP 1998-369928	A	19981225		
	JP 1998-369936	A	19981225		
	JP 1998-369969	A	19981225		

JP 1998-369986   A   19981225
JP 1998-373667   A   19981228
JP 1999-65072   A   19990311
WO 1999-JP2658   W   19990520
US 2001-700988   A3   20010205

AB The batteries contain cathodes, anodes, and **Li** salt electrolytes; have capacity ≥30 W.h, energy d. ≥180 W.h/L, and thickness ≤12 mm. Preferably, the cathodes contain Mn oxide and the anode active mass has a **graphite** core with d002 ≤0.34 nm and an amorphous C surface layer with d002 ≥0.34 nm. The batteries are tested for charge-discharge characteristics at several spots and the operation of the **batteries** are **controlled** by the testing results.

ST **secondary lithium battery** operation **control**; **graphite** amorphous **carbon** anode **lithium** battery

IT Battery anodes
(anodes from amorphous **carbon** coated **graphite** with **controlled** interplanar spacings for **secondary lithium batteries**)

IT **Carbonaceous** materials (technological products)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(anodes from amorphous **carbon** coated **graphite** with **controlled** interplanar spacings for **secondary lithium batteries**)

IT **Polyolefin** fibers
RL: DEV (Device component use); USES (Uses)
(ethylene; separators from nonwoven fabrics and nonwoven fabric-porous membrane laminates for **secondary lithium** batteries)

IT **Secondary** batteries
(**lithium**; anodes from amorphous **carbon** coated **graphite** and operation **control** methods for **secondary lithium batteries**)

IT **Secondary** battery separators
(separators from nonwoven fabrics and nonwoven fabric-porous membrane laminates for **secondary lithium** batteries)

IT **Polypropene** fibers, uses
RL: DEV (Device component use); USES (Uses)
(separators from nonwoven fabrics and nonwoven fabric-porous membrane laminates for **secondary lithium** batteries)

IT **7782-42-5, Graphite**, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(anodes from amorphous **carbon** coated **graphite** with **controlled** interplanar spacings for **secondary lithium batteries**)

IT 9002-88-4, **Polyethylene**
RL: DEV (Device component use); USES (Uses)
(separators from nonwoven fabrics and nonwoven fabric-porous membrane laminates for **secondary lithium** batteries)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
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(2) Anon; EP 201875 A CAPLUS
(3) Anon; US 4650730 A
(4) Anon; US 5723232 A CAPLUS
(5) Anon; US 5879417 A CAPLUS
(6) Anon; EP 740356 A1 CAPLUS
(7) Anon; BR 8602159 A CAPLUS
(8) Anon; AU 8656764 A
(9) Anon; KR 9203758 B1
(10) Asahi Chemical Industry Co, Ltd; JP 06-295744 A 1994 CAPLUS
(11) FDK Corp; JP 63-202853 A 1988 CAPLUS
(12) Hitachi, Ltd; JP 10-261440 A 1998 CAPLUS
(13) Hitachi, Ltd; JP 11-54155 A 1999 CAPLUS
(14) Matsushita Electric Industrial Co, Ltd; JP 63-202859 A 1988 CAPLUS
(15) Ricoh Co, Ltd; JP 07-134987 1995 CAPLUS
(16) Sharp Corp; JP 09-17418 A 1997 CAPLUS
(17) Sony Corp; JP 07-226232 A 1995
(18) Sony Corp; JP 09-161763 A 1997 CAPLUS
(19) WR Grace & Co Conecticut; JP 08-287897 A 1996 CAPLUS

L36 ANSWER 37 OF 68 CAPLUS
AN 1999:78776 CAPLUS
DN 130:156110
ED Entered STN: 05 Feb 1999
TI **Secondary** lithium **battery** with good cycling performance
IN Takeuchi, Seiji; Honbo, Hidetoshi; Nishimura, Katsunori; Yoshikawa, Masanori; Muranaka, Kiyoshi
PA Hitachi, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M002-16; H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11031532	A2	19990202	JP 1997-183658	19970709
PRAI	JP 1997-183658		19970709		

AB The **battery** has (1) $LiNiO_2$ as cathode active mass having Li/Ni mol. ratio 0.96-1.04, C axis length of the crystal $\leq$14.205 Å, and ratio of $Ni^{3+}/(Ni^{3+} + Ni^{2+})$ in the $LiNiO_2$ $\geq$0.99, (2) a high-crystalline-quality or amorphous C material as anode active mass containing or loading Ag fine particles, (3) a mixture of $\leq$33 volume% cyclic ester with a chain ester as a nonaq. electrolyte, and (4) a **polypropylene**, **polyethylene**, and **polyolefin**-based porous film as a separator having energy d. 384-420 **Wh/l.** The **battery** has high discharge capacity and long cycle life.
ST lithium **battery** cycling performance; **carbon** silver

lithium **battery** anode; ester cyclic chain lithium
battery electrolyte; **polypropylene** porous film lithium
battery separator; **polyethylene** porous film lithium
battery separator; **polyolefin** porous film lithium
battery separator; nickel lithium oxide **battery** cathode

IT **Battery** anodes
Battery cathodes
Battery electrolytes
Secondary battery separators
(Li **battery** with LiNiO2 cathode, Ag-containing C anode, cyclic ester/chain ester mixture as electrolyte, and **polymer** porous separator)

IT **Polyolefins**
RL: DEV (Device component use); USES (Uses)
(Li **battery** with LiNiO2 cathode, Ag-containing C anode, cyclic ester/chain ester mixture as electrolyte, and **polymer** porous separator)

IT 108-32-7, Propylene **carbonate** 110-71-4 9002-88-4, **Polyethylene** 9003-07-0, **Polypropylene**
RL: DEV (Device component use); USES (Uses)
(Li **battery** with LiNiO2 cathode, Ag-containing C anode, cyclic ester/chain ester mixture as electrolyte, and **polymer** porous separator)

IT 7440-22-4, Silver, uses 7782-42-5, **Graphite**, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(Li **battery** with LiNiO2 cathode, Ag-containing C anode, cyclic ester/chain ester mixture as electrolyte, and **polymer** porous separator)

IT 12031-65-1P, Lithium nickel oxide (LiNiO2)
RL: DEV (Device component use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
(Li **battery** with LiNiO2 cathode, Ag-containing C anode, cyclic ester/chain ester mixture as electrolyte, and **polymer** porous separator)

L36 ANSWER 38 OF 68 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2000-042604 [04] WPIX
DNN N2000-032254 DNC C2000-011857
TI Cathode structure of lithium ion **secondary battery** for portable apparatus - has cathode mixture layer of predefined density.
DC L03 X16
PA (HITM) HITACHI MAXELL KK
CYC 1
PI JP 11297310 A 19991029 (200004)* 7 H01M004-02
ADT JP 11297310 A JP 1998-102437 19980414
PRAI JP 1998-102437 19980414
IC ICM H01M004-02
ICS H01M004-58; H01M010-40
AB JP 11297310 A UPAB: 20000203
NOVELTY - The **battery** contains **carbon** group material included in cathode active material. The capacitive density of the

battery is 400 **Whs/l** or more. The density of cathode mixture layer (2) is 1.55 g/cm3 or less. DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the first time charging method of lithium ion **secondary battery.**

USE - In lithium ion **secondary battery** for portable apparatus.

ADVANTAGE - The lithium ion **secondary battery** excels in cycle characteristics. DESCRIPTION OF DRAWING(S) - The figure shows the sectional drawing of lithium ion **secondary battery.** (2) Cathode mixture layer.

Dwg.1/1

FS CPI EPI
FA AB; GI
MC CPI: L03-E01B3; L03-E03
EPI: X16-B01F1; X16-E01C

L36 ANSWER 39 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:764090 CAPLUS
DN 130:54821
ED Entered STN: 07 Dec 1998
TI Electrode materials for **secondary nonaqueous** electrolyte **batteries** and manufacture of the electrodes
IN Kuroki, Takashi; Sakata, Yoshihiro; Shibuya, Atsushi; Okumura, Tomomi; Okawa, Yuichi; Oikawa, Hideaki
PA Mitsui Chemicals Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M004-04; H01M004-58; H01M004-60; H01M004-64
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10312791	A2	19981124	JP 1997-185430	19970710
PRAI	JP 1997-59107		19970313		

AB The electrode materials are mixts. containing ≥1 F free thermoplastic, having a glass transition temperature ≥50° and selected from **polyimide, polyamide, polysulfone**, and **polyether**, and powdered C having a bulk d. 80-90% of its real d. The electrodes are prepared by pressing the mixture at a temperature above the glass transition temperature of the **polymer.**
ST battery electrode thermoplastic **carbon** mixt
IT Battery electrodes
Secondary batteries
(**carbon** powder and fluorine free thermoplastics with **controlled** properties for **battery** electrode manufacture)
IT **Polyamides**, uses
Polyethers, uses
Polyimides, uses

Polysulfones, uses
Polythiophenylenes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(**carbon** powder and fluorine free thermoplastics with **controlled** properties for **battery** electrode manufacture)

IT **7782-42-5, Graphite**, uses 25038-54-4, Nylon 6, uses 32131-17-2, Nylon 66, uses 61128-24-3, Ultem 110281-80-6
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(**carbon** powder and fluorine free thermoplastics with **controlled** properties for **battery** electrode manufacture)

L36 ANSWER 40 OF 68 CAPLUS
AN 1998:684700 CAPLUS
DN 129:304529
ED Entered STN: 29 Oct 1998
TI Manufacture of **secondary nonaqueous** electrolyte **batteries**
IN Tanaka, Keisuke; Kato, Akihiko; Okamoto, Kiyomi
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10284121	A2	19981023	JP 1997-89153	19970408
PRAI	JP 1997-89153		19970408		

AB The batteries, having porous separators between **Li** containing multiple oxide cathodes and **carbonaceous** anodes, are prepared by inserting a coiled electrode-separator stack and an electrolyte solution containing ≥30% cyclic **carbonate** esters, e.g., ethylene **carbonate**, in a battery case, where the electrode stack and the electrolyte solution are heated at 30-50° to accelerate electrolyte penetration.
ST **secondary lithium** battery manuf electrolyte impregnation
IT **Carbonaceous** materials (technological products)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(anodes; temperature **control** in manufacture of **secondary lithium battery** for electrolyte penetration in electrode-separator stacks)
IT **Secondary batteries**
(**lithium**; temperature **control** in manufacture of **secondary lithium battery** for electrolyte penetration in electrode-separator stacks)

IT 7782-42-5, **Graphite**, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(anodes; temperature **control** in manufacture of **secondary lithium battery** for electrolyte penetration in electrode-separator stacks)
IT 12190-79-3, Cobalt **lithium** oxide (CoLiO2)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(cathodes; temperature **control** in manufacture of **secondary lithium battery** for electrolyte penetration in electrode-separator stacks)
IT 9003-07-0, **Polypropylene**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(separators; temperature **control** in manufacture of **secondary lithium battery** for electrolyte penetration in electrode-separator stacks)
IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 21324-40-3, **Lithium** hexafluorophosphate
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(temperature **control** in manufacture of **secondary lithium battery** for electrolyte penetration in electrode-separator stacks)

L36 ANSWER 41 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:202722 CAPLUS
DN 128:246167
ED Entered STN: 09 Apr 1998
TI Technical development of **polyacene** (PAS) **batteries.** Safety and creditability
AU Anekawa, Akihiro; Hato, Yukinori
CS Battery Bus. Promot. Div., Kanebo, Ltd., Osaka, 534, Japan
SO Erekutoronikusu (1998), 43(4), 51-53
CODEN: EREKDE; ISSN: 0421-3513
PB Ohmsha
DT Journal; General Review
LA Japanese
CC 52-0 (Electrochemical, Radiational, and Thermal Energy Technology)
AB A review with 3 refs. on the use of **polyacenic** semiconductors (PAS), developed by Kanebo Co. Ltd. since 1989, as an anode in Li **secondary batteries**, and as capacitor electrodes in mini back-up **batteries.** Utilization of Li-intercalated PAS (up to C2Li) as anode and LiCoO2 as cathode gave a small **secondary battery** (18 mm .vphi., 65 mm length) with capacity of 2300 mAh and energy d. of 450 **Wh/L.** Scale-up of the PAS **secondary battery** and PAS capacitor may provide more efficient elec. cars.
ST review safety **polyacene battery** capacitor; lithium **battery polyacene** anode review; capacitor **polyacene** electrode review

IT **Secondary batteries**
(lithium; safety and creditability in tech. development of **polyacene** (PAS) **batteries**)

IT **Battery** anodes
Capacitor electrodes
Conducting **polymers**
Electric vehicles
Safety
(safety and creditability in tech. development of **polyacene** (PAS) **batteries**)

IT **Polyacenes**
RL: DEV (Device component use); USES (Uses)
(safety and creditability in tech. development of **polyacene** (PAS) **batteries**)

IT 7439-93-2, Lithium, uses 12190-79-3, Lithium cobaltate $LiCoO_2$
RL: DEV (Device component use); USES (Uses)
(safety and creditability in tech. development of **polyacene** (PAS) **batteries**)

L36 ANSWER 42 OF 68 CAPLUS
AN 1997:719794 CAPLUS
DN 128:5728
ED Entered STN: 14 Nov 1997
TI **Secondary nonaqueous** electrolyte **batteries** with **carbonaceous** anodes
IN Yamashita, Hirohisa
PA Murata Mfg. Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09283183	A2	19971031	JP 1996-96806	19960418
PRAI	JP 1996-96806		19960418		

AB The batteries use **Li** containing oxide cathodes and **carbonaceous** anodes, where the anode has an active mass layer ≤ 30 μm thick and contain ≥ 1.5 g **carbonaceous** material /cm3. The **carbonaceous** material is selected from natural **graphite**, coke, meso **carbon** microbeads, and charred **polymers.** These batteries have high capacity and long cycle life.

ST **lithium** battery **carbonaceous** anode; **graphite** anode **lithium** battery; coke anode **lithium** battery; meso **carbon** microbead anode **lithium** battery; **polymer** char anode **lithium** battery

IT **Polymers**, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical

process); PROC (Process); USES (Uses)
(charred; controlled thickness and filling d. of **carbonaceous** anodes for **secondary lithium** batteries)

IT **Battery** anodes
(**controlled** thickness and filling d. of **carbonaceous** anodes for **secondary lithium** batteries)

IT Coke
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(controlled thickness and filling d. of **carbonaceous** anodes for **secondary lithium** batteries)

IT **7782-42-5**, **Graphite**, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(controlled thickness and filling d. of **carbonaceous** anodes for **secondary lithium** batteries)

IT 7440-44-0, **Carbon**, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(meso, microbeads; controlled thickness and filling d. of **carbonaceous** anodes for **secondary lithium** batteries)

L36 ANSWER 43 OF 68 CAPLUS
AN 1997:617786 CAPLUS
DN 127:265560
ED Entered STN: 27 Sep 1997
TI Manufacture of **secondary nonaqueous** electrolyte **batteries**
IN Endo, Masanori
PA Murata Mfg. Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09245835	A2	19970919	JP 1996-46239	19960304
PRAI	JP 1996-46239		19960304		

AB In the manufacture of batteries using **Li** containing oxide cathodes, nonaq. electrolytes, and **carbonaceous** anode, the batteries are charged to 25-50% anode capacity and discharged to a cutoff voltage of 1.0-2.5 V after assembling. The anode may be natural **graphite**, coke, meso **carbon** microbeads, or synthetic **resin** char; and the cathode may be $LiCoO_2$, $LiNiO_2$, or $LiMn_2O_4$. These batteries have high capacity and long cycle life.
ST **lithium** battery manuf initial charge discharge
IT **Secondary batteries**
(**controlled** initial charge and discharge in manufacture of

secondary lithium batteries)

L36 ANSWER 44 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:557407 CAPLUS
DN 127:222950
ED Entered STN: 01 Sep 1997
TI **Secondary nonaqueous** electrolyte **batteries**
IN Ishizuka, Hiroshi; Funatsu, Eiji; Maekawa, Yukio
PA Fuji Photo Film Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M010-40; H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09213366	A2	19970815	JP 1996-13732	19960130
PRAI	JP 1996-13732		19960130		

AB The batteries use **Li** intercalating electrodes, having 10-45% porosity in the cathode and/or anode active mass mixts., and an electrolyte solution of a F containing **Li** salt dissolved in a solvent mixture containing ethylene **carbonate** and $\geq$1 of Et2CO3, EtCO3Me, Me propionate, Et propionate, Me methoxy acetate, and Et methoxy acetate. The cathodes and/or anodes may have a protective layer containing water insol. particles. These batteries have long cycle life.
ST **lithium** battery electrode porosity; solvent mixt **lithium** battery; **carbonate** ester solvent mixt **lithium** battery; propionate ester solvent mixt **lithium** battery; methoxyacetate ester solvent mixt **lithium** battery
IT Battery electrolytes
(compns. of solvent mixts. for fluorine containing **lithium** salt electrolytes in **secondary lithium** batteries)
IT **Battery** electrodes
(**controlled** porosity of electrode active mass layers and electrode protection films in **secondary lithium** batteries for cycle life)
IT **Secondary** batteries
(electrode structure and electrolyte solvent mixture compns. for **secondary lithium** batteries)
IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(protective films containing α-alumina and **polytetrafluoroethylene** for electrodes in **secondary lithium** batteries)
IT 1344-28-1, Alumina, uses
RL: MOA (Modifier or additive use); USES (Uses)
(-; protective films containing α-alumina and **polytetrafluoroethylene** for electrodes in **secondary lithium** batteries)

IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene **carbonate** 105-37-3, Ethyl propionate 105-58-8, Diethyl **carbonate** 108-32-7, Propylene **carbonate** 554-12-1, Methyl propionate 616-38-6, Dimethyl **carbonate** 623-53-0, Ethyl methyl **carbonate** 3938-96-3, Ethyl methoxy acetate 6290-49-9, Methyl methoxy acetate 14283-07-9, **Lithium** fluoroborate 21324-40-3, **Lithium** hexafluorophosphate 33454-82-9, **Lithium** trifluoromethanesulfonate
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(compns. of solvent mixts. for fluorine containing **lithium** salt electrolytes in **secondary lithium** batteries)

IT **7782-42-5**, **Graphite**, uses 12031-65-1, **Lithium** nickel oxide ($LiNiO_2$) 12057-17-9, **Lithium manganese oxide** ($LiMn_2O_4$) 12190-79-3, Cobalt **lithium** oxide ($CoLiO_2$) 176547-74-3, Tin metaphosphate oxide silicate ($Sn(PO_3)_{0.2}O_{0.1}(SiO_3)_{0.8}$) 179802-04-1 188198-63-2 191231-18-2 193266-49-8 194930-39-7
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(controlled porosity of electrode active mass layers in **secondary lithium** batteries for cycle life)

IT 9002-84-0, **Polytetrafluoroethylene**
RL: MOA (Modifier or additive use); USES (Uses)
(protective films containing α-alumina and **polytetrafluoroethylene** for electrodes in **secondary lithium** batteries)

L36 ANSWER 45 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5
AN 1997:143592 CAPLUS
DN 126:174188
ED Entered STN: 05 Mar 1997
TI High performance S-type cathode
AU Chu, May-Ying; Visco, Steven J.; De Jonghe, Lutgard C.
CS PolyPlus Battery Company, Berkeley, CA, 97410, USA
SO Annual Battery Conference on Applications and Advances, 12th, Long Beach, Calif., Jan. 14-17, 1997 (1997), 133-134. Editor(s): Frank, Harvey A.; Seo, Eddie T. Publisher: Institute of Electrical and Electronics Engineers, New York, N. Y.
CODEN: 64AVAV
DT Conference
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB **PolyPlus Battery** Company (PPBC) is developing an advanced lithium **polymer** rechargeable **battery** based on proprietary pos. electrode chemical In one formulation, this electrode contains elemental sulfur, either free or in association with **secondary** materials that promote its utilization. **Batteries** based on this cathode chemical offer high steady-state (>250 W/kg) and high peak power densities (3000 W/kg), in a low cost and environmentally benign format. High energy d., in excess of 500 **Wh**/kg (600 **Wh/l**), can also be achieved. The

high power and energy densities, along with the low toxicity and low cost
of materials used in the **PolyPlus** solid-state cells make this
battery exceptionally attractive for both hybrid and elec.
vehicles, and for consumer electronic applications.

ST sulfur cathode lithium **secondary battery**; elec vehicle
lithium **battery** sulfur cathode; electronics com lithium
battery sulfur cathode

IT Electric apparatus
(com.; high performance S-type cathodes for advanced Li **polymer**
secondary batteries)

IT **Battery** cathodes
Electric vehicles
(high performance S-type cathodes for advanced Li **polymer**
secondary batteries)

IT **Secondary batteries**
(lithium; high performance S-type cathodes for advanced Li
polymer secondary batteries)

IT 7704-34-9, Sulfur, uses
RL: DEV (Device component use); USES (Uses)
(cathodes; high performance S-type cathodes for advanced Li
polymer secondary batteries)

L36 ANSWER 46 OF 68 CAPLUS

AN 1997:658973 CAPLUS

DN 127:320877

ED Entered STN: 17 Oct 1997

TI High performance nickel-**metal** hydride and lithium-ion
batteries

AU Koehler, Uwe; Kruger, Franz J.; Kuempers, Joerg; Maul, Matthias;
Niggemann, Eberhard; Schoenfelder, Herbert H.

CS VARTA Batterie AG, Kelkheim, D-65779, Germany

SO Proceedings of the Intersociety Energy Conversion Engineering Conference
(1997), 32nd, 93-98
CODEN: PIECDE; ISSN: 0146-955X

PB Society of Automotive Engineers

DT Journal

LA English

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

AB The development of high performance traction **batteries** is a key
issue for the future market acceptance of elec. and hybrid vehicles. The
Ni-**metal** hydride (NiMH) system is besides Li-ion the most
promising **battery** system for elec. vehicles. NiMH
batteries have already penetrated the consumer market worldwide.
Due to its high design flexibility and robustness the NiMH **battery**
system is an ideal candidate for the whole range of **battery**
applications from small consumer cells up to large traction
batteries. Because of its high power capability for charging and
discharging, the NiMH system is regarded as the optimum **battery**
system for hybrid vehicles. VARTA is developing three different NiMH
product lines: high energy, high power and ultra-high power cells. The
specific energy of these products exceeds 80 **Wh**/kg (high energy
cells) and a specific power of more than 1000 W/kg (ultra high power

cells) can be achieved. Since the first announcement of commercialization of Li-ion as a rechargeable consumer **battery** in 1991 by SONY, the Li-ion technol. has seen an unprecedented rise to what is now considered to be the most promising rechargeable **battery** technol. of the future. Not only in the consumer sector where Li-ion type **batteries** have gained already a substantial market share but also for applications such as elec. vehicles, load leveling and aerospace systems this technol. is under intense development. The most prominent feature of the Li-ion **battery** system is its high gravimetric and volumetric energy d. Although still in the early stage of development, large prismatic Li-ion cells reach specific energies of more than 120 **Wh**/kg and energy densities over 300 **Wh/L.** There is a predicted potential for a further increase of the specific energy of more than 30% and for the energy d. of above 60% during the next 4 yr. The system works within a wide temperature range of -20 to +50° and can run up to 1200 cycles. The Li-ion system represents the latest **battery** technol. It is expected to be the dominating technol. for elec. vehicles and aerospace applications. Therefore, VARTA has developed large prismatic cells up to 240 **Wh** employing low cost manganese spinel cathodes and **carbon** anodes.

ST **battery** nickel **metal** hydride lithium ion

IT Electric vehicles
Secondary batteries
(high performance nickel-**metal** hydride and lithium-ion **batteries**)

IT **Secondary batteries**
(lithium; high performance nickel-**metal** hydride and lithium-ion **batteries**)

L36 ANSWER 47 OF 68 METADEX COPYRIGHT 2004 CSA on STN

AN 1997(10):34-787 METADEX

TI Nickel-**metal** hydride **batteries** and **metallic** materials.

AU Sakai, T. (Osaka National Research Institute); Ishikawa, H. (Osaka National Research Institute)

SO Materia Japan (1997) 36, (1), 20-24, Photomicrographs, 20 ref.
ISSN: 1340-2625

DT Journal

CY Japan

LA Japanese

AB In recent years, commercialized **batteries** for Electrical Vehicles (EV) are under development. Such components are indispensable for environmental protection. The paper reviews the technical breakthroughs of the past ten years, and the social transitions with focusing on nickel-hydrogen **batteries**. In 1980 the number of sealed nickel-chromium **batteries** were 100 million, but by 1995 the figure had reached to 1.2 billion with 260 billion Yen sales, out of which Ni-Cr **battery** covers 300 million, production of lithium **battery** is 30 million, and Japanese produce almost 70% of world secondary compact **batteries.** Such new type of **batteries** are 100% produced in Japan, with ever increase in demand such as recent numbers that indicate more than 30 million mobile telephones and PHS are

used in Japan. Toyota developed an EV (RAV4L) in 1996 as seen in the photograph for which test runs have resulted 200 km travel distance with each **battery** charge. For nickel-**metal** hydride **battery** electrode, materials like LaNi5 are used, but less costly alternative to lanthanum like manganese, aluminum are also being considered. For which the hydrogen separation temperature is reduced to 0.1 Mpa at 333K, and through replacement-addition of cobalt, improvements like corrosion resistance, and resistance to granulization is obtained in produced alloy of: MnNi5-x(Co, Mn, Al)x. Energy density of such newly developed compact **batteries** is equivalent to 648 GJ/m 3(180 **Wh/L**) to 1080 GJ/m 3(300 **Wh/L**) which is almost equivalent to Li **battery.** Application cases are video cameras, note-type personal computers, and many more.

CC 34 Chemical and Electrochemical Properties

CT Journal Article; Storage **batteries**: Development; Hydrogen storage

ET Cr*Ni; Cr sy 2; sy 2; Ni sy 2; Ni-Cr; La*Ni; La sy 2; LaNi5; La cp; cp; Ni cp; K; Co*Mn*Ni; Co sy 3; sy 3; Mn sy 3; Ni sy 3; MnNi5-x(Co; Mn cp; Co cp; Mn; Al; Li

L36 ANSWER 48 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN

AN 1998(13):3685 COMPENDEX

TI Design and performance of 10 **Wh** rechargeable lithium **batteries.**

AU Nishimura, K. (Hitachi, Ltd, Ibaraki-ken, Jpn); Honbo, H.; Takeuchi, S.; Horiba, T.; Oda, M.; Koseki, M.; Muranaka, Y.; Kozono, Y.; Miyadera, H.

MT Proceedings of the 1996 8th International Meeting on Lithium Batteries.Part 2 (of 2).

ML Nagoya, Jpn

MD 16 Jun 1996-21 Jun 1996

SO Journal of Power Sources v 68 n 2 pt 2 Oct 1997.p 436-439
CODEN: JPSODZ ISSN: 0378-7753

PY 1997

MN 47692

DT Journal

TC Experimental

LA English

AB New **metal-carbon** composite anodes were developed by a chemical deposition method of **metal** particles onto **graphite** powder. Silver-**graphite** composites consisted of ultrafine silver particles on a **graphite** surface, exhibiting a large specific volume capacity of 468-505 Ah/l which may be due to Li Ag alloy formation.The Ag-**graphite** anodes also showed excellent cycleability over 700 charge/discharge cycles with only 3% capacity loss.10 **Wh** class rechargeable lithium **batteries** with energy densities of 270-300 **Wh/l** were manufactured using Ag-**graphite** anodes and cathodes of LiNiO2 or LiCoO2.Little capacity loss in these **batteries** was found even after 250 cycles because of the highly durable Ag-**graphite** anodes.(Author abstract) 2 Refs.

CC 702.1.1 Primary Batteries; 702.1.2 Secondary Batteries; 714.1 Electron Tubes; 547.1 Precious Metals; 813.2 Coating Materials; 804 Chemical

Products Generally
CT *Lithium **batteries**; **Secondary batteries**;
Anodes; **Graphite**; **Carbon**; Silver
ST **Metal carbon** composite anodes; Rechargeable lithium **batteries**
ET Li; Ag; Li*Ni*O; Li sy 3; sy 3; Ni sy 3; O sy 3; LiNiO2; Li cp; cp; Ni cp; O cp; Co*Li*O; Co sy 3; LiCoO2; Co cp

L36 ANSWER 49 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:624625 CAPLUS
DN 127:296181
ED Entered STN: 01 Oct 1997
TI Performance of 10 **Wh** rechargeable lithium **batteries** using new **metal-carbon** composite anodes (Ag-deposited **graphite**)
AU Muranaka, Y.; Nishimura, K.; Honbo, H.; Takeuchi, S.; Andou, H.; Kozono, Y.; Miyadera, H.; Oda, M.; Koseki, M.; Horiba, T.
CS Hitachi Research Laboratory, Hitachi, Ltd., Hitachi-shi, 319-12, Japan
SO EVS-13, International Electric Vehicle Symposium, 13th, Osaka, Oct. 13-16, 1996 (1996), Volume 2, 682-687 Publisher: Japan Electric Vehicle Association, Tokyo, Japan.
CODEN: 65CBAM
DT Conference
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB Rechargeable lithium **batteries** with energy densities of 240-360 **Wh/L** and 120-180 **Wh**/kg, and the cycleability over 3500 cycles (for 10 yr use) at charge and discharge rates of 0.125 C have been developed directed towards energy storage systems of 20-30 kWh size under the grant of New Energy and Industrial Technol. Development Organization (NEDO). In order to realize the long cycleability (3500 cycles) of rechargeable lithium **batteries**, a new **metal-carbon** composite anode (noted as Ag-G) has been developed, which is composed of ultrafine silver particles highly dispersed on lithium intercalating **graphite** powders. X ray diffraction measurements indicated that silver particles in Ag-G anodes electrochem. alloyed with lithium ions and released them during charge/discharge processes. This finding relates to larger volumetric specific capacities (810 Ah/L) for Ag-G than that of conventional **graphite** (680 Ah/L) by 20%. Ag-G also had an advantage of no decay of volumetric specific capacity during 600 charge/discharge cycles. Sealed 10 **Wh** size lithium rechargeable **batteries** (H 80 mm X D 8.9 mm X W 60 mm) were designed and manufactured using Ag-G as anodes and LiCoO2 or LiNiO2 as cathodes. **Batteries** of the Ag-G/LiCoO2 system had a specific energy d. of 270 **Wh/L**, and exhibited a stable discharge capacity of 11.5 **Wh** during 550 charge/discharge cycles at the rate of 0.125 C. **Batteries** of the Ag-G/LiNiO2 system revealed a discharge capacity of 12.9 **Wh** without any capacity loss during 150 cycles, and its specific energy d. was 300 **Wh/L.**
ST lithium **battery** rechargeable silver **graphite** anode
IT **Secondary batteries**

(lithium; rechargeable 10 **Wh** lithium **batteries** using new silver-**graphite** composite anodes)

IT **Battery** anodes
Intercalation
(rechargeable 10 **Wh** lithium **batteries** using new silver-**graphite** composite anodes)

IT 7782-42-5, **Graphite**, uses
RL: DEV (Device component use); USES (Uses)
(powdered; rechargeable 10 **Wh** lithium **batteries** using new silver-**graphite** composite anodes)

IT 12031-65-1, Lithium nickel oxide linio2 12190-79-3, Lithium cobalt oxide licoo2
RL: DEV (Device component use); USES (Uses)
(rechargeable 10 **Wh** lithium **batteries** using new silver-**graphite** composite anodes)

IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(rechargeable 10 **Wh** lithium **batteries** using new silver-**graphite** composite anodes)

IT 96-49-1, Ethylene **carbonate** 616-38-6, Dimethyl **carbonate** 21324-40-3, Lithium hexafluorophosphate
RL: TEM (Technical or engineered material use); USES (Uses)
(rechargeable 10 **Wh** lithium **batteries** using new silver-**graphite** composite anodes)

IT 7440-22-4, Silver, uses
RL: DEV (Device component use); USES (Uses)
(ultrafine particles; rechargeable 10 **Wh** lithium **batteries** using new silver-**graphite** composite anodes)

L36 ANSWER 50 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1996(31):3736 COMPENDEX
TI Lithiated manganese oxide cathodes for rechargeable lithium **batteries.**
AU Abraham, K.M. (EIC Lab, Inc, Norwood, MA, USA); Pasquariello, D.M.; Nguyen, T.H.; Jiang, Z.; Peramunage, D.
MT Proceedings of the 1996 11th Annual Battery Conference on Applications and Advances.
MO IEEE
ML Long Beach, CA, USA
MD 09 Jan 1996-12 Jan 1996
SO Proceedings of the Annual Battery Conference on Applications and Advances 1996.IEEE, Piscataway, NJ, USA,96TH8133.p 317-323
CODEN: PBAAE8
PY 1996
MN 44739
DT Conference Article
TC General Review
LA English
AB Lithiated manganese oxides LixMnyOz prepared at the low temperature of 400-450 degree C exhibited significantly different electrochemical properties than the spinel phase, LiM2O4, formed at 650-850 degree C.The

former was non-stoichiometric and yielded a capacity of approximately 0.7 Li/Mn2 unit at approximately 2.8 V in **polymer** electrolyte-based Li cells.Its excellent rechargeability was demonstrated by more than 100 charge/discharge cycles.Spinel LiMn2O4 was formed by heating either a mixture of LiOH and MnO2 or LiCO3 and MnCO3.The latter reaction yielded micron-sized LiMn2O4.Its capacity of approximately 0.8Li/LiMn2O4 at approximately 4 V was highly reversible.AA-size Li-ion cells with spinel LiMn2O4 exhibited 100 **Wh**/Kg and 280 **Wh/l**
.(Author abstract) 6 Refs.

CC 702.1.1 Primary Batteries; 702.1.2 Secondary Batteries; 804.2 Inorganic Components; 801.4.1 Electrochemistry; 815.1.1 Organic Polymers; 817.1 Plastics Products

CT *Lithium **batteries**; Lithium compounds; Electrochemistry; Thermal effects; **Polyelectrolytes**; Charging (**batteries**); Electric discharges; **Secondary batteries**; Cathodes

ST Lithiated manganese oxides; Rechargeable lithium **batteries**

ET Li*Mn*O; Li sy 3; sy 3; Mn sy 3; O sy 3; LixMnyOz; Li cp; cp; Mn cp; O cp; C; Li; LiMn2O4; H*Li*O; LiOH; H cp; Mn*O; MnO2; C*Li*O; LiCO3; C cp; C*Mn*O; MnCO3

L36 ANSWER 51 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN

AN 1996(31):3708 COMPENDEX

TI High specific power lithium **polymer** rechargeable **battery**
.

AU Chu, May-Ying (PolyPlus Battery Co, Berkeley, CA, USA); De Jonghe, Lutgard; Visco, Steven

MT Proceedings of the 1996 11th Annual Battery Conference on Applications and Advances.

MO IEEE

ML Long Beach, CA, USA

MD 09 Jan 1996-12 Jan 1996

SO Proceedings of the Annual Battery Conference on Applications and Advances 1996.IEEE, Piscataway, NJ, USA,96TH8133.p 163-165
CODEN: PBAAE8

PY 1996

MN 44739

DT Conference Article

TC Experimental

LA English

AB **PolyPlus Battery** Company (PPBC) is developing an advanced lithium **polymer** rechargeable **battery** based on its proprietary positive electrode.This **battery** offers high steady-state (greater than 250 W/kg) and peak power densities (3000 W/kg), in a low cost and environmentally benign format.This **PolyPlus** lithium **polymer battery** also delivers high specific energy.The first generation **battery** has a energy density of 100 **Wh**/kg (120 **Wh/l**) and subsequent generations increases the performance in excess of 500 **Wh**/kg (600 **Wh/l**).The high power and energy densities, along with the low toxicity and low cost of materials used in the **PolyPlus** solid-state cell make this **battery** exceptionally attractive for both hybrid and electric vehicle

applications.(Author abstract) 4 Refs.
CC 702.1.2 Secondary Batteries; 702.1.1 Primary Batteries; 817.1 Plastics Products
CT ***Secondary batteries**; Lithium **batteries**; Charging (**batteries**); Plastic products; Electrodes
ST Energy density

L36 ANSWER 52 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1995(45):427 COMPENDEX
TI Characteristics of deeply Li-doped **polyacenic** semiconductor material and fabrication of a Li **secondary battery.**
AU Yata, Shizukuni (Kanebo Ltd, Osaka, Jpn); Hato, Yukinori; Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Yamaguchi, Masaki; Tanaka, Kazuyoshi; Yamabe, Tokio
SO Synthetic Metals v 73 n 3 Aug 15 1995.p 273-277
CODEN: SYMEDZ ISSN: 0379-6779
PY 1995
DT Journal
TC Experimental
LA English
AB Electrochemical properties of deeply Li-doped **polyacenic** semiconductor (PAS) material have been investigated. It has been found that a PAS electrode can be doped up to the C2Li stage without any Li-**metal** electrolysis and that it has a reversible capacity of 850 mAh/g. Fabrication of the **secondary** PAS **battery** of the cylindrical type has also been attempted.The energy density of this **battery** has turned out to be 450 **Wh/l**, which is about twice as large as that of conventional Li-ion **batteries** .(Author abstract) 17 Refs.
CC 712.1 Semiconducting Materials; 815.1.1 Organic Polymers; 542.4 Lithium and Alloys; 801.4 Physical Chemistry; 702.1.2 Secondary Batteries; 801.4.1 Electrochemistry
CT *Semiconducting **polymers**; X ray analysis; Fabrication; **Secondary batteries**; Electrochemistry; Electrodes; Electrolysis; Electric conductivity; Lithium; Doping (additives)
ST Lithium doped **polyacenic** semiconductor material; Reversible capacity; Energy density; Lithium ion **batteries**; Electrochemical properties
ET Li; C*Li; C2Li; C cp; cp; Li cp

L36 ANSWER 53 OF 68 METADEX COPYRIGHT 2004 CSA on STN
AN 1995(8):61-738 METADEX
TI Performances and safety behaviour of rechargeable AA-size Li/LixMnO2 cell.
AU Dan, P. (Bar-Ilan University); Mengeritski, E. (Bar-Ilan University); Geronov, Y. (Bar-Ilan University); Aurbach, D. (Bar-Ilan University); Weisman I. (Bar-Ilan University)
SO J. Power Sources (Mar. 1995) 54, (1), 143-145, Graphs, 9 ref.
Conference: Seventh International Meeting on Lithium Batteries, Boston, Massachusetts, USA, 15-20 May 1994
ISSN: 0378-7753
DT Journal
LA English

AB An Li/LixMnO2 rechargeable system was developed. The AA cell based on a lithium **metal** anode and lithiated manganese dioxide cathode, organic electrolyte and polypropylene separator, exhibits excellent performance and safety behavior. The cell possesses an energy density of 125-140 **Wh**/kg and 280-315 **Wh/l.** An accumulated capacity of approx200 Ah can be achieved under cycling. The system incorporates a chemical mechanism preventing explosion, fire and venting with fire under abuse conditions such as short circuit, overcharge, deep discharge, etc.
CC 61 Engineering Components and Structures
CT Journal Article; Electric **batteries**: Development; Lithium: End uses; Safety
ET Li; Li*Mn*O; Li sy 3; sy 3; Mn sy 3; O sy 3; LixMnO2; Li cp; cp; Mn cp; O cp

L36 ANSWER 54 OF 68 JICST-EPlus COPYRIGHT 2004 JST on STN
AN 950712031 JICST-EPlus
TI Lithium Secondary **Batteries.**
AU SAKURAI Y; SHIBATA M; YAMAKI J; SUGIHARA S
CS Nippon Telegr. and Teleph. Corp.
SO NTT Rev, (1995) vol. 7, no. 4, pp. 60-64. Journal Code: F0282B (Fig. 6, Tbl. 2, Ref. 11)
ISSN: 0915-2334
CY Japan
DT Journal; Commentary
LA English
STA New
AB This paper briefly reviews the state of the art of rechargeable lithium **batteries** and describes a prototype M size rechargeable lithium/amorphous V2O5 (a-V2O5) cell with respect to cell properties as well as safety. The cell exhibits a high energy density of 110 **Wh** /kg or 250 **Wh/l** along with a low self discharge rate of 1 % per month. Preliminary safety evaluation test results showed that the Li/ a-V2O5 cell can be developed as a safe system. (author abst.)
CC YB04030K (621.355)
CT secondary **battery**; lithium; vanadium oxide; amorphous state; technology development; safety; electrical characteristic; charge(**battery**)
BT chemical cell; **battery**; alkali **metal**; **metallic** element; element; second row element; **metal** oxide; oxide; chalcogenide; oxygen group element compound; oxygen compound; vanadium compound; 5A group element compound; transition **metal** compound; glassy state; solid(matter); research and development; development; property; characteristic

L36 ANSWER 55 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1995(28):4625 COMPENDEX
TI Development of coin-type lithium-ion rechargeable **batteries.**
AU Asami, Yoshiaki (Technology Lab Toshiba Battery Co, Ltd, Tokyo, Jpn); Tsuchiya, Kenji; Nose, Hiroyoshi; Suzuki, Shintaro; Mizushina, Kiyoto
MT Proceedings of the 7th International Meeting on Lithium Batteries. Part 1.
ML Boston, MA, USA

MD 15 May 1994-20 May 1994
SO Journal of Power Sources v 54 n 1 pt 1 Mar 1995.p 146-150
CODEN: JPSODZ ISSN: 0378-7753
PY 1995
MN 43020
DT Journal
TC Experimental
LA English
AB We developed coin-type lithium-ion rechargeable **batteries** made of crystalline V2O5 for the cathode and pitch-based **carbon** for the anode.We optimized the capacity balance of cathode and anode materials.The **batteries** have a high operating voltage of about 2.7 V and excellent charge/discharge cycle characteristics.We also designed the **batteries** whose cathode potential is over 3 V versus lithium when the **batteries** are overdischarged to 0 V.Therefore, the **batteries** have excellent recovery characteristics even after overdischarge.The **batteries** have high energy density (about 100 **Wh/l**) which is about two times that of the coin-type Ni-Cd **batteries.**It can serve as a memory backup power source with a single **battery.**(Author abstract) 9 Refs.
CC 702.1.2 Secondary Batteries; 702.1.1 Primary Batteries; 804.2 Inorganic Components; 933.1 Crystalline Solids; 715.1 Electronic Equipment (non-communication); 701.1 Electricity: Basic Concepts and Phenomena
CT ***Secondary batteries**; Vanadium compounds; Crystalline materials; Cathodes; **Carbon**; Charging (**batteries**); Electric discharges; Reliability; Lithium **batteries**
ST Coin type lithium ion rechargeable **batteries**; Pitch based **carbon**; Energy density; Overdischarge; Vanadium pentoxide
ET O*V; V2O5; V cp; cp; O cp; Cd*Ni; Cd sy 2; sy 2; Ni sy 2; Ni-Cd

L36 ANSWER 56 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1995(28):4618 COMPENDEX
TI LixNiO2, a promising cathode for rechargeable lithium **batteries.**
AU Broussely, M. (SAFT Advanced Battery Div, Poitiers, Fr); Perton, F.; Biensan, P.; Bodet, J.M.; Labat, J.; Lecerf, A.; Delmas, C.; Rougier, A.; Peres, J.P.
MT Proceedings of the 7th International Meeting on Lithium Batteries. Part 1.
ML Boston, MA, USA
MD 15 May 1994-20 May 1994
SO Journal of Power Sources v 54 n 1 pt 1 Mar 1995.p 109-114
CODEN: JPSODZ ISSN: 0378-7753
PY 1995
MN 43020
DT Journal
TC Experimental
LA English
AB Lithiated nickel oxide has been prepared and studied with the aim of using it as the positive active reversible material in rechargeable lithium **batteries.**This paper describes the particular features of this material, and discusses the results that demonstrate its interest as cathode in practical cells, using **carbon** as the negative

electrode.Specific energy and energy density of more than 130 **Wh** /kg and 320 **Wh/l** were obtained in prototypes, and a cycleability of over 1000 cycles was demonstrated.(Author abstract) 9 Refs.

CC 702.1.2 Secondary Batteries; 702.1.1 Primary Batteries; 715.1 Electronic Equipment (non-communication); 804.2 Inorganic Components; 933.1.1 Crystal Lattice; 933.1 Crystalline Solids

CT ***Secondary batteries**; Oxides; Nickel compounds; **Carbon**; X ray diffraction analysis; Synthesis (chemical); Crystalline materials; Crystal structure; Lithium **batteries**; Cathodes

ST Lithiated nickel oxide; Specific energy; Energy density

ET Li*Ni*O; Li sy 3; sy 3; Ni sy 3; O sy 3; LixNiO2; Li cp; cp; Ni cp; O cp

L36 ANSWER 57 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN

AN 1995(28):4624 COMPENDEX

TI Performances and safety behaviour of rechargeable AA-size Li/LixMnO2 cell.

AU Dan, P. (Tadiran Battery Div, Rehovot, Isr); Mengeritski, E.; Geronov, Y.; Aurbach, D.; Weisman, I.

MT Proceedings of the 7th International Meeting on Lithium Batteries. Part 1.

ML Boston, MA, USA

MD 15 May 1994-20 May 1994

SO Journal of Power Sources v 54 n 1 pt 1 Mar 1995.p 143-145
CODEN: JPSODZ ISSN: 0378-7753

PY 1995

MN 43020

DT Journal

TC Experimental

LA English

AB An Li/LixMnO2 rechargeable system was developed.The AA cell based on a lithium **metal** anode and lithiated manganese dioxide cathode, organic electrolyte and **polypropylene** separator, exhibits excellent performance and safety behaviour.The cell possesses an energy density of 125 to 140 **Wh**/kg and 280 to 315 **Wh/ l**.An accumulated capacity of about 200 Ah can be achieved under cycling. The system incorporates a chemical mechanism preventing explosion, fire and venting with fire under abuse conditions such as short circuit, overcharge, deep discharge, etc.(Author abstract) 9 Refs.

CC 702.1.2 Secondary Batteries; 702.1.1 Primary Batteries; 914.1 Accidents and Accident Prevention; 804.2 Inorganic Components; 715.1 Electronic Equipment (non-communication); 708.2 Conducting Materials

CT ***Secondary batteries**; Charging (**batteries**); Manganese compounds; Anodes; Cathodes; Electrolytes; **Polypropylenes**; Separators; Lithium **batteries**; Accident prevention

ST Safety behaviour; Energy density; Manganese dioxide; Organic electrolyte

ET Li; Li*Mn*O; Li sy 3; sy 3; Mn sy 3; O sy 3; LixMnO2; Li cp; cp; Mn cp; O cp

L36 ANSWER 58 OF 68 METADEX COPYRIGHT 2004 CSA on STN

AN 1995(6):61-460 METADEX

TI Disordered materials in consumer and electric-vehicle nickel-hydride

batteries.

AU Ovshinsky, S.R. (Ovonic Battery); Fetcenko, M.A. (Ovonic Battery); Venkatesan, S. (Ovonic Battery); Chao, B. (Ovonic Battery)

SO The Electrochemical Society. 10 South Main St., Pennington, NJ 08534-2896, USA. 1994. 344-362, Graphs, Photomicrographs, 16 ref. Conference: Electrochemistry and Materials Science of Cathodic Hydrogen Absorption and Adsorption, San Francisco, CA, USA, 22-27 May 1994 ISBN: 1-56677-078-5

DT Conference Article

CY United States

LA English

AB A proprietary Ni **metal** hydride **battery** has been developed by the Ovonic **Battery** Co. which stores hydrogen in the solid hydride phase and has high energy density, high power, and a long cycle life. Nickel **metal** hydride **batteries** readily tolerate abuse, have a wide range of operating temperature, can be quick-charged, and are totally sealed and maintenance-free. A broad range of multi-element **metal** hydride materials that use structural and compositional disorder on several scales of length have been engineered for use as the negative electrode in this **battery.** The **battery** operates at ambient temperature, is made of nontoxic materials, and is completely recyclable. **Metal** hydride materials and electrodes are now in high volume production. Small consumer **batteries** are being produced that have 70-80 **Wh**/kg specific energy, over 240 **Wh/l** energy density, and excellent overall characteristics. Larger size **batteries** up to 52 kWh have been demonstrated in electric vehicles. Recent performance results are presented, as well as projections for next generation product performance. Electrode materials cited are V22Ti17Zr16Ni39Cr7 and V18Ti15Zr18Ni29Co7Mn8.

CC 61 Engineering Components and Structures

CT Conference Paper; Nickel base alloys: End uses; **Metallic** glasses: End uses; Electrodes: Materials selection; Storage **batteries**: Development; Electric vehicles

ALI V22Ti17Zr16Ni39Cr7 CCA: NI; V18Ti15Zr18Ni29Co7Mn8 CCA: NI ; ALLOY5 V 22 Ti 17 Zr 16 Ni 39 Cr 7 CCA: NI; ALLOY6 V 18 Ti 15 Zr 18 Ni 29 Co 7 Mn 8 CCA: NI

ET Ni; Co; Cr*Ni*Ti*V*Zr; Cr sy 5; sy 5; Ni sy 5; Ti sy 5; V sy 5; Zr sy 5; V22Ti17Zr16Ni39Cr7; V cp; cp; Ti cp; Zr cp; Ni cp; Cr cp; Co*Mn*Ni*Ti*V*Zr; Co sy 6; sy 6; Mn sy 6; Ni sy 6; Ti sy 6; V sy 6; Zr sy 6; V18Ti15Zr18Ni29Co7Mn8; Co cp; Mn cp

L36 ANSWER 59 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN

AN 1995(2):856 COMPENDEX

TI Lithium-ion rechargeable **batteries** with LiCoO2 and **carbon** electrodes: The LiCoO2/C system.

AU Ozawa, Kazunori (Sony Corp, Tokyo, Jpn)

SO Solid State Ionics v 69 n 3-4 Aug 1994.p 212-221 CODEN: SSIOD3 ISSN: 0167-2738

PY 1994

DT Journal

TC Application; Experimental

LA English
AB Lithium-ion rechargeable **battery** with LiCoO2 cathode and non-graphitizable **carbon** anode has high energy density (253 **Wh/l** in 18650).By using LiPF6 containing propylene **carbonate**/diethyl **carbonate** electrolyte solution, excellent cycle performance can be obtained even at a moderately high temperature, because (1) LiCoO2 remains stable, and (2) non-graphitizable **carbon** exhibits a good cyclability with respect to Li-doping/undoping capability. Although a thin film is formed on the **carbon** surface during charge and discharge cycling, the discharge capacity degradation is only 10 to 20% after 500 cycles.Furthermore, even if the cell is overcharged, safety can be attained (1) by providing an anti-overcharging safety device which operates when Li2CO3 in the cathode is decomposed and (2) by using a **polyolefin** separator which shuts down at a high temperature due to overcharge current. (Author abstract) 21 Refs.
CC 702.1.2 Secondary Batteries; 715.1 Electronic Equipment (non-communication); 804.2 Inorganic Components; 708.2 Conducting Materials; 701.1 Electricity: Basic Concepts and Phenomena; 704.2 Electric Equipment
CT *Lithium **batteries**; Cathodes; Doping (additives); Anodes; **Carbon**; Lithium compounds; Electrolytes; Solutions; Thin films; **Secondary batteries**
ST **Secondary** lithium **batteries**; Lithium cobalt dioxide cathodes; Nongraphitizable **carbon** anodes; Cycle performance; Discharge capacity; **Polyolefin** separator; Anti overcharging safety device
ET Co*Li*O; Co sy 3; sy 3; Li sy 3; O sy 3; LiCoO2; Li cp; cp; Co cp; O cp; F*Li*P; LiPF6; P cp; F cp; Li; C*Li*O; Li2CO3; C cp

L36 ANSWER 60 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1993(49):243 COMPENDEX
TI Directions in **secondary** lithium **battery** research and development.
AU Abraham, K.M. (EIC Lab Inc, Norwood, MA, USA)
SO Electrochimica Acta v 38 n 9 Jun 1993.p 1233-1248
CODEN: ELCAAV ISSN: 0013-4686
PY 1993
DT Journal
TC Experimental
LA English
AB The diverse directions in which research and development on ambient temperature **secondary** lithium **batteries** is proceeding are discussed.The state-of-the-art in liquid electrolyte-based systems containing Li **metal** as the anode can be described in terms of the various AA-size cells developed; they are capable of 250-300 full depth of discharge cycles, specific energies of 100-130 **Wh** kgminus 1 and energy densities of 250-300 **Wh l** minus 1.The commercialization of these **batteries** has been deterred by concerns of safety hazards.Approaches being pursued to resolve the safety issue include the identification of new or improved electrolytes, the use of alternative anodes, such as lithiated **carbon** with lower Li

activity, and improved microporous separators having smaller pore size, higher porosity and 'shut down' capability.The emergence of the **carbon** anode-based 'Li ion' **batteries** are potentially safe systems makes it necessary to identify organic electrolytes with oxidative stability to potentials of up to 5 V vs.Li plus /Li.Solid-**polymer** electrolyte-based solid-state **batteries** are being developed for a variety of military and consumer applications including electric vehicle propulsion. Solid-state **batteries** with performance reminiscent of their liquid electrolyte counterparts can be fabricated with the use of non-conventional **polymer** electrolytes.These are composed of low volatility organic liquid electrolytes embedded in organic **polymer** networks and have conductivities of greater than 10 minus 3 ohm minus 1 cm minus 1 at 20 degree C, A C/LiMn2O4 cell utilizing such an electrolyte exceeded four hundred discharge/charge cycles.(Author abstract) 54 Refs.

CC 702.1.2 Secondary Batteries; 901.3 Engineering Research; 549.1 Alkali Metals; 704.1 Electric Components; 804 Chemical Products Generally

CT ***Secondary batteries**; Engineering research; Lithium; Electrolytes; Electrodes; **Carbon**; Lithium compounds; Electric **batteries**

ST **Secondary** lithium **batteries**; Liquid electrolytes; Anodes; Lithium **metal**; Lithium ion **batteries**; Lithium manganese oxide

ET Li; C; Li*Mn*O; Li sy 3; sy 3; Mn sy 3; O sy 3; LiMn2O4; Li cp; cp; Mn cp; O cp

L36 ANSWER 61 OF 68 METADEX COPYRIGHT 2004 CSA on STN

AN 1993(7):58-769 METADEX

TI Nickel/**Metal** Hydride **Batteries** Using Microencapsulated Hydrogen Storage Alloy.

AU Zhang, Y. (Nankai University); Chen, Y. (Nankai University); Chen, J. (Nankai University)

SO The Minerals, Metals & Materials Society. 420 Commonwealth Dr., Warrendale, Pennsylvania 15086, USA. 1993. 1031-1033, Diffraction patterns, Photomicrographs, 10 ref. Accession Number: 93(7):72-346 Conference: The First Pacific Rim International Conference on Advanced Materials and Processing. (PRICM-1), Hangzhou, China, 23-27 June 1992

DT Conference Article

CY United States

LA English

AB Fine particles of M m Ni5(M m: abbreviation for mischmetal) multicomponent hydrogen storage alloys are encapsulated with a thin layer of Ni approx 0.5 mu m thick by a special chemical plating method. With the alloy as an anode material, **metal** hydride electrodes and sealed Ni/ **metal** hydride (Ni/MH) **batteries** of AA size are made. The electrode has a higher discharge capacity and a longer cycle life than that using the bare (uncoated) alloy. The **battery** discharge capacity of 120 mAh is obtained, which is equivalent to 60 **Wh**/kg (180Wh/**L**), and the high rate discharge capacity is good. After 1000 complete charge-discharge cycles, the **battery** capacity only loses 5%. The results analyzed by SEM photos, X-ray diffraction patterns and corrosion measurement show that the microencapsulation of the alloy is

very effective on the performances of the **battery.**
CC 58 Metallic Coating
CT Conference Paper; Electric **batteries**; Hydrogen storage; Encapsulation; Nickel plating; Hydrides: Cladding
ET Ni5; Ni

L36 ANSWER 62 OF 68 METADEX COPYRIGHT 2004 CSA on STN
AN 1996(6):61-621 METADEX
TI Ovonic nickel **metal** hydride **batteries** for space applications.
AU Venkatesan, S. (Ovonic Battery); Corrigan, D.A. (Ovonic Battery); Fetcenko, M.A. (Ovonic Battery); Gifford, P.R. (Ovonic Battery); Dhar, S.K. (Ovonic Battery); Ovshinsky, S.R. (Ovonic Battery)
SO NASA Centre for Aerospace Information. P.O. Box 8757, Baltimore, MD 21240-0757, USA. 1993. 61-66, Graphs, 7 ref.
Conference: Fourth Space Electrochemical Research and Technology (SERT) Conference, Cleveland, Ohio, USA, 14-15 Apr. 1993
DT Conference Article
CY United States
LA English
AB Ovonic nickel-**metal** hydride (NiMH) rechargeable **batteries** are easily adaptable to a variety of applications. Small consumer NiMH cells have been developed and are now being manufactured by licensees throughout the world. This technology has been successfully scaled up in larger prismatic cells aimed at electric vehicle applications. Sealed cells aimed at satellite power applications have also been built and cycle tested by OBC and other outside agencies. Prototype **batteries** with high specific energy (over 80 **Wh**/kg), high energy density (245 **Wh/L**), and excellent power capability (400 W/kg) have been produced. Ovonic NiMH **batteries** have demonstrated an excellent cycle life of over 10,000 cycles at 30% DOD. Presently, Ovonic **Battery** Company is working on an advanced version of this **battery** for space applications as part of an SBIR contract from NASA.
CC 61 Engineering Components and Structures
CT Conference Paper; Nickel: End uses; Electric **batteries**: Development; Spacecraft: Materials selection

L36 ANSWER 63 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1993(37):2267 COMPENDEX
TI Preparation of **polypyrrole** and **polythiophene** in the presence of ferrocene derivatives.
AU Lee, Changjin (Korea Research Inst of Chemical Technology, Daejeon, South Korea); Lee, Myong-Hoon; Kang, Yong Ku; Moon, Bong Seok; Rhee, Suh Bong
MT Proceedings of the International Conference on Science and Technology of Synthetic Metals - ICSM '92.
ML Goteborg, Swed
MD 12 Aug 1992-18 Aug 1992
SO Synthetic Metals v 55 n 2-3 pt 2 Mar 22 1993.p 1119-1122
CODEN: SYMEDZ ISSN: 0379-6779
PY 1993
MN 18773

DT Journal
TC Application; Experimental
LA English
AB **Polypyrroles** doped with electroactive materials such as ferrocenemonosulfonate, ferrocenedisulfonate, and **poly** (vinylferrocenesulfonate) were prepared and their electrochemical properties were studied.**Polypyrrole** doped with **poly** (vinylferrocenesulfonate) was examined for the rechargeable **battery electrode** material.A fairly high energy **density** (384 **Wh**/Kg) was obtained for the lithium/ **polypyrrole-poly**(vinylferrocenesulfonate) battery.A facile release of ferrocenemonosulfonate from **polypyrrole** was observed during redox cycles whereas **poly** (vinylferrocenesulfonate) in the **polypyrrole** matrix was retained for more than hundreds of cycles. Combined with the smooth and uniform film forming property, **polypyrrole** doped with **poly** (vinylferrocenesulfonate) is a promising electrode material for the rechargeable battery.(Author abstract) 17 Refs.
CC 815.1.1 Organic Polymers; 802.2 Chemical Reactions; 804.1 Organic Components; 801.4.1 Electrochemistry; 702.1.2 Secondary Batteries; 817.1 Plastics Products
CT *Aromatic **polymers**; Electrodes; Doping (additives); Electrochemistry; Iron compounds; Organometallics; Redox reactions; **Secondary** batteries; Synthesis (chemical); Aromatic **polymers**
ST **Polypyrrole**; Ferrocene derivatives

L36 ANSWER 64 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1992(2):14726 COMPENDEX DN 920217776
TI Novel solid redox **polymerization** electrodes.All-solid-state, thin-film, rechargeable lithium **batteries.**
AU Liu, Meilin (Lawrence Berkeley Lab, Berkeley, CA, USA); Visco, Steven J.; De Jonghe, Lutgard C.
SO J Electrochem Soc v 138 n 7 Jul 1991 p 1891-1895
CODEN: JESOAN ISSN: 0013-4651
PY 1991
DT Journal
TC Experimental
LA English
AB Lithium **batteries** using solid redox **polymerization** electrodes (SRPEs) maintain the inherent advantages of all-solid-state, thin-film systems while overcoming some of the limitations of using intercalation compounds as positive electrode (i.e., insufficient rate capability and capacity utilization).Laboratory Li/PEO/SRPE cells have demonstrated higher power capability, energy density, and capacity utilization than analogous Li/PEO/TiS2 cells.One of the Li/PEO/SRPE cells has achieved 350 cycles from 50 to 93 degree C with a sustained energy density of 160 **Wh**/kg (190 **Wh/l**), power density of 120 W/kg (140 W/l), and 40-75% capacity utilization of the **polymerization** electrode.At 100 degree C, power densities of over 1800 W/kg (2200 W/l) at energy densities of 140 **Wh**/kg (170 **Wh/l**) have been achieved with up to 96% utilization of

cathode capacity.At ambient temperatures (35 degree C), the cells can be discharged at a current density of 250 mu A/cm2, achieving a film capacity of 0.5 C/cm2. (Author abstract) 10 Refs.

CC 702 Electric Batteries & Fuel Cells; 817 Plastics, Products & Applications; 802 Chemical Apparatus & Plants

CT *ELECTRIC **BATTERIES**, **SECONDARY**:Lithium; CHEMICAL REACTIONS:Redox; ELECTRODES, ELECTROCHEMICAL:**Polymer** Membrane

ST SOLID REDOX **POLYMERIZATION** ELECTRODES; RECHARGEABLE LITHIUM ELECTRIC **BATTERIES**

ET Li; S*Ti; TiS2; Ti cp; cp; S cp; C

L36 ANSWER 65 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1989:461055 CAPLUS

DN 111:61055

ED Entered STN: 20 Aug 1989

TI **Secondary nonaqueous batteries**

IN Yokogawa, Masaaki; Hashimoto, Toshio

PA Sony Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M004-02
ICS H01M004-58; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01105459	A2	19890421	JP 1987-261971	19871017
	JP 2611265	B2	19970521		
PRAI	JP 1987-261971		19871017		

AB **Secondary nonaq. batteries** have LiMn2O4-(8-22)% **graphite** mixture cathodes. These mixts. are resistant to cracking during discharge, and provide long charge-discharge cycle life and high capacity. Thus, LiMn2O4 obtained by baking a **MnO2**-Li2CO3 mixture was mixed with **graphite** and kneaded with **poly**(vinylidene fluoride) and N-methyl-2-pyrrolidone to obtain a paste. A battery using a cathode prepared by coating an Al collector with the above paste, a **Li** anode, and a 1M LiPF6/propylene **carbonate**-MeOCH2CH2OMe electrolyte had capacities 478 and 461 mA-h, at the 1st and the 20th charge-discharge cycles, resp., vs. 400 and 386 mA-h for a **control battery** using a LiMn2O4-**graphite** mixture having a **graphite** concentration higher than the invention range.

ST **lithium manganese oxide** battery cathode; **graphite lithium manganese oxide** cathode

IT Cathodes
(battery, **lithium manganese oxide**, optimum **graphite** content in)

IT **7782-42-5**, **Graphite**, uses and miscellaneous
RL: USES (Uses)

(cathodes containing, **lithium manganese oxide**
, for **secondary** batteries)
IT 89452-56-2
RL: USES (Uses)
(cathodes, optimum **graphite** content in, for batteries)

L36 ANSWER 66 OF 68 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1987(4):61925 COMPENDEX
TI FEASIBILITY STUDY OF A NEW ZINC-AIR BATTERY CONCEPT USING FLOWING ALKALINE ELECTROLYTE.
AU Ross, Philip N.Jr. (Lawrence Berkeley Lab, CA, USA)
MT 21st Intersociety Energy Conversion Engineering Conference: Advancing toward Technology Breakout in Energy Conversion.
MO ACS, Washington, DC, USA; SAE, Warrendale, PA, USA; ANS, La Grange Park, IL, USA; AIChE, New York, NY, USA; IEEE, New York, NY, USA; et al
ML San Diego, CA, USA
MD 25 Aug 1986-29 Aug 1986
SO Proceedings of the Intersociety Energy Conversion Engineering Conference 21st.Publ by ACS, Washington, DC, USA.p 1066-1072
CODEN: PIECDE ISSN: 0146-955X
ISBN: 0-8412-0986-3
PY 1986
MN 09310
DT Conference Article
LA English
AB Proof-of-principle experiments are reported for a new concept in electrically rechargeable zinc-air **battery.**The zinc **electrode** is a **porous** flow-through type using a copper foam **metal** substrate with zinc deposition onto the foam **metal** from concentrated zincate electrolyte (as used in zinc-slurry type batteries).The bifunctional air electrode is made of low-cost materials, being fabricated entirely from **carbon**-based precursors and small amounts of nickel and/or cobalt oxide.Corrosion measurements on the **graphite** materials in the air electrode indicate sufficient corrosion resistance for 800-hr life on-charge.A prototype single cell has been constructed having a 1.5-Ah capacity producing 1.2-V discharge/2.0 V charge at the three hour rate, and has produced stable voltages for more than 150 cycles.Based on the prototype characteristics, design calculations for a 32-kWh battery project an energy density of about 110 **Wh**/kg, peak power density of 140 W/kg, electrical efficiency of 60% and materials cost of less than equivalent to 20 per kWh.11 refs.
CC 702 Electric Batteries & Fuel Cells; 803 Chemical Agents & Basic Industrial Chemicals; 804 Chemical Products
CT *ELECTRIC BATTERIES, **SECONDARY**; ELECTROLYTES
ST ZINC-AIR BATTERY CONCEPT; BIFUNCTIONAL AIR ELECTRODE
ET V

L36 ANSWER 67 OF 68 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1986:409259 CAPLUS
DN 105:9259
ED Entered STN: 13 Jul 1986

TI **Secondary nonaqueous batteries**
IN Nakajima, Tadashi; Masuda, Yoshitomo; Ogawa, Masao; Toyosawa, Shinichi; Miyazaki, Tadaaki; Kawagoe, Takahiro; Fujio, Ryota
PA Bridgestone Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-60
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 60262355	A2	19851225	JP 1984-117807	19840608
PRAI	JP 1984-117807		19840608		

AB Cathode active material of the title batteries contains **polyphenyleneimine** derivs. RNH(C6H4NH)nR1, where R, R1 = H, alkyl, Ph, alkylphenyl, naphthyl; and n ≥1. The anode of the batteries may contain **polyaniline** or **graphite.** The use of **polyphenyleneimines** as cathode complements the disadvantages of **polyaniline** batteries, i.e., large increase of cathode potential in charging, and stabilized the battery discharge performance. Thus, a battery using **poly**(N,N'-diphenyl-p-phenylenediamine) cathode, a **Li** and, and M LiClO4 in propylene **carbonate** electrolyte showed 3.4-3.5 V in charging and 3.4-3.2 V in discharging vs. resp. values of 2.8-4.2 and 4.1-2.7 V for a **control battery** having **polyaniline** cathode.
ST battery cathode **polyphenyleneimine; polymer** battery cathode
IT **Batteries**, **secondary**
(**lithium-polyphenyleneimine**, with **nonaq.** electrolyte)
IT 102771-69-7
RL: USES (Uses)
(cathodes, for batteries with organic electrolyte)

L36 ANSWER 68 OF 68 METADEX COPYRIGHT 2004 CSA on STN
AN 1984(6):61-395 METADEX
TI Technico-Economic Assessment of **Batteries** for Electric Road Vehicles.
AU Dell, R.M.; Hooper, A.; Jensen, J.; Markin, T.L.; Rasmussen, F.
SO Commission of the European Communities. Noiyr Postale 1003, Luxembourg. 1984. 68-80. Accession Number: 84(6):72-414
Conference: Advanced Batteries and Fuel Cells, Talence, France, 25-26 Apr. 1983
DT Conference
LA English
AB An economic analysis is made of the over-all operating costs of four electric road vehicles (a car, two vans and a truck) and compared with the costs for the equivalent internal combustion engine (ICE) vehicles. It is shown that, at currently projected production rates and costs, electric

vehicles are unfavorable unless national ICEV taxes and EV subsidies are taken into account. The cost analysis reveals different characteristics for each of the four vehicles. For the truck, a substantial reduction in **battery** price or a doubling of its assumed life would make a notable impact on the over-all economics. On the other hand, for the smaller vehicles, price is relatively unimportant. A design study has been made for an all-solid-state Li EV traction **battery** based on an extrapolation of the laboratory results for small-scale cells obtained in the project. With bipolar **battery** design it is shown that very high-energy densities (425 **Wh**/kg and 500 **Wh/l**
) are potentially attainable at realistic power densities. It is not yet possible to cost such **batteries** realistically, but preliminary calculations, using the current materials of construction, indicate a materials-only cost of approx pounds sterling 30/kWh for the **battery** modules. To reduce this figure significantly it will be necessary to lower the cost of the Li salt in the **polymer** electrolyte and of the intercalation compound in the cathode. An ultimate target of pounds sterling 20-25/kWh for the materials cost seems feasible. This analysis focuses the objectives for future research. 10 reference-AA

CC 61 ENGINEERING COMPONENTS AND STRUCTURES
CT Electric **batteries**: Design; Electric vehicles; Economics
ET Li

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L Number	Hits	Search Text	DB	Time stamp
15	2	"2003282057"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:22
16	1	2004-046911.NRAN.	DERWENT	2004/05/06 11:21
17	2	"2003282146"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:29
18	1	2004-002586.NRAN.	DERWENT	2004/05/06 11:22
19	3	"2002246068"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:30
20	3	"2001017052"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:30
21	2	"6664006"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:48
22	2	"2001243980"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:33
23	1	2001-203030.NRAN.	DERWENT	2004/05/06 11:33
24	2	"2000251934"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:34
25	30	"637450"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:34
26	1	"6664006" and mm	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 11:52
27	184	capacity near3 WH	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 12:15
28	1	2000-096979.NRAN.	DERWENT	2004/05/06 12:03
29	0	koehler-u$>in.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 12:15

30	227	koehler-u$.in.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 12:15
31	8	koehler-u$.in. and batteries	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 12:15
32	28	koehler-u$.in. and battery	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 12:15
33	30	(koehler-u$.in. and batteries) (koehler-u$.in. and battery)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 12:16
34	5	high with performance with nickel with metal with hydride with lithium	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:17
35	11	("5352968" | "5455499" | "5656917" | "5656920" | "5739596" | "5818197" | "5844884" | "5883497" | "5889385" | "5965998" | "5998972").PN.	USPAT	2004/05/06 12:17
36	1531	varta-$.as.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:17
37	274	varta-$.as. and (429/$.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:50
38	11	(varta-$.as. and (429/$.ccls.)) and wh	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:21
39	7	(varta-$.as. and (429/$.ccls.)) and "energy densities"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:23
40	6	((varta-$.as. and (429/$.ccls.)) and "energy densities") not ((varta-$.as. and (429/$.ccls.)) and wh)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:24
41	257	(varta-$.as. and (429/$.ccls.)) not (((varta-$.as. and (429/$.ccls.)) and wh) ((varta-$.as. and (429/$.ccls.)) and "energy densities") (((varta-$.as. and (429/$.ccls.)) and "energy densities") not ((varta-$.as. and (429/$.ccls.)) and wh)))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:24
42	197	(varta-$.as. and (429/$.ccls.)) not (li lithium)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:24

43	17	(varta-$.as. and (429/$.ccls.)) not ((varta-$.as. and (429/$.ccls.)) not (((varta-$.as. and (429/$.ccls.)) and wh) ((varta-$.as. and (429/$.ccls.)) and "energy densities") (((varta-$.as. and (429/$.ccls.)) and "energy densities") not ((varta-$.as. and (429/$.ccls.)) and wh))))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:38
44	23057	(small$3 tiny microscale) near5 (battery batteries)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:38
45	30115	(small$3 tiny microscale thin) near5 (battery batteries)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:38
46	23812	((small$3 tiny microscale thin) near5 (battery batteries)) not (li lithium)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:38
47	6303	((small$3 tiny microscale thin) near5 (battery batteries)) not (((small$3 tiny microscale thin) near5 (battery batteries)) not (li lithium))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:38
48	3848	(((small$3 tiny microscale thin) near5 (battery batteries)) not (((small$3 tiny microscale thin) near5 (battery batteries)) not (li lithium))) and (429/$.ccls. h01m$.ipc.)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:50
49	307	((((small$3 tiny microscale thin) near5 (battery batteries)) not (((small$3 tiny microscale thin) near5 (battery batteries)) not (li lithium))) and (429/$.ccls. h01m$.ipc.)) and (wh watts "wh/l")	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:39
50	307	((((small$3 tiny microscale thin) near5 (battery batteries)) not (((small$3 tiny microscale thin) near5 (battery batteries)) not (li lithium))) and (429/$.ccls. h01m$.ipc.)) and (wh watt "wh/l")	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:48
51	2	6664006.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:50

52	42	("3734876" | "4164068" | "4505997" | "4654279" | "4737422" | "4792504" | "4794059" | "4808496" | "4830939" | "4911995" | "4960655" | "4970012" | "4990413" | "5006431" | "5019467" | "5030527" | "5047300" | "5057385" | "5100746" | "5102752" | "5196484" | "5238759" | "5281682" | "5296318" | "5360684" | "5415948" | "5423110" | "5516339" | "5521023" | "5522028" | "5552239" | "5631103" | "5639573" | "5695873" | "5705084" | "5834137" | "6001509" | "6007935" | "6030421" | "6060185" | "6159638" | "6187062").PN.	USPAT	2004/05/06 13:48
53	24098	power adj densit$3	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:50
54	20998	(power adj densit$3) not (li lithium)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:53
55	3100	(power adj densit$3) not ((power adj densit$3) not (li lithium))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:50
56	807	((power adj densit$3) not ((power adj densit$3) not (li lithium))) and (429/$.ccls. h01m$.ipc.)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:54
57	149	((power adj densit$3) not ((power adj densit$3) not (li lithium))) and (429/$.ccls. h01m$.ipc.)	EPO; JPO; DERWENT	2004/05/06 13:51
58	4	(((power adj densit$3) not ((power adj densit$3) not (li lithium))) and (429/$.ccls. h01m$.ipc.)) and ((small$3 tiny microscale thin) near5 (battery batteries))	EPO; JPO; DERWENT	2004/05/06 13:53
59	10173	wh (watt$1 adj hour$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:56
60	8118	(wh (watt$1 adj hour$1)) not (li lithium)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:53
61	2055	(wh (watt$1 adj hour$1)) not ((wh (watt$1 adj hour$1)) not (li lithium))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:54
62	929	((wh (watt$1 adj hour$1)) not ((wh (watt$1 adj hour$1)) not (li lithium))) and (429/$.ccls. h01m$.ipc.)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 13:54

63	10173	wh! (watt$1 adj hour$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 14:03
64	23458	(energy cell battery) near capacity	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 14:03
65	23458	(energy cell battery) near1 capacity	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 14:03
66	202	((energy cell battery) near1 capacity) with (wh! (watt$1 adj hour$1))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 14:03
67	71	(((energy cell battery) near1 capacity) with (wh! (watt$1 adj hour$1))) not (li lithium)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 14:03
68	131	(((energy cell battery) near1 capacity) with (wh! (watt$1 adj hour$1))) not ((((energy cell battery) near1 capacity) with (wh! (watt$1 adj hour$1))) not (li lithium))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/05/06 14:06
69	1	(JP-2003282146-$ or WO-9960652-$).did.	EPO	2004/05/06 14:11